



DELAGUA CLEAN COOKING GROUPED PROJECT IN RWANDA



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Prepared by	Climate Secure

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1 PROJECT DETAILS

1.1 Summary Description of the Project

Summary description of the technologies/measures to be implemented by the project:

'DelAgua clean cooking grouped project in Rwanda' is a voluntary Grouped Project (GP) aimed at distributing fuel efficient improved cookstoves (ICS) to households in Rwanda. The Project Participant (PP) of the GP for all the communication, management, and ownership rights of the Greenhouse Gas (GHG) Emission Reduction Units (ERU) is DelAgua Health Rwanda (Voluntary) Limited (DelAgua) and the ICS under this GP will be distributed by DelAgua. The distribution of ICS is not mandated by Rwandan law and the Grouped Project is a voluntary initiative being run by the PP DelAgua. The program is not being implemented as a result of any government legislation or intervention. Throughout this Project Description, this grouped project may be interchangeably referred as "program". The PP plan to distribute 400,000 improved cookstove under the grouped project during first renewable crediting period. It is intended that under this GP two types of single pot portable stoves will be distributed, which are SSM S32 X stove and Burn Kuniokoa G2¹. Each household will receive 1 ICS.

The location of the project:

Under the GP, DelAgua will distribute the project technologies to individual households and communities within the host country Rwanda. The PAIs will occur in geographically defined regions within Rwanda. The details of the GP and PAI locations are provided in Section 1.13 of this document. All households will be in rural areas of the identified regions in section 1.13 of this document.

Implementation Dates:

Full details of implementation dates and numbers for each PAI under the GP are laid out in section 1.12 of this document.

An explanation of how the project is expected to generate GHG emission reductions or removals:

The GP will follow the VCS Methodology from Sectoral Scope 3 - VM0050 "Energy Efficiency And Fuel-Switch Measures In Cookstoves", version 1.0 for ER calculations. The implementation (distribution of ICS units) and parameters set for ER calculations within the GP will be monitored on a periodic basis, based on the requirements provided within the applied methodology.

The cookstove project in Rwanda will reduce GHG emissions by replacing inefficient traditional wood-fuel cookstoves with high-efficiency ICS units. By improving combustion efficiency and reducing firewood consumption, the project will reduce equivalent GHG emissions from incomplete combustion and help prevent deforestation. Additionally, the project will improve indoor air quality, reduce fuel costs, and enhance community well-being, contributing to both climate change mitigation and sustainable development.

A brief description of the scenario existing prior to the implementation of the project:

¹ The # of ICS and models specified are not binding and may change during the crediting period. Any new ICS model included shall meet the methodology applicability and grouped project inclusion criteria.

The scenario existing prior to the implementation of the project activity would be usage of 3-stone fire and/or traditional stoves, for meeting equivalent thermal energy needs, which have a very low thermal efficiency of 15%², and therefore consume a higher amount of firewood as fuel for cooking.

An estimate of annual average and total GHG emission reductions and removals:

The average annual and total GHG emission reduction expected from the grouped project is expected to be 2,123,460 and 14,864,219 tCO₂e, respectively, over the first 7-year crediting period.

The project is neither transferred nor registered in any GHG mechanism, this project is green field project and explicitly applying the VCS registration.

1.2 Audit History

Audit type	Period	Program	Validation/verification body name	Number of years
Joint Validation/verification	11-October-2021 to 28-February-2023	VCS	Earthood Services Pvt Ltd	1.386 years (506 days)
2 nd Verification	01 March 2023 – 29 February 2024	VCS	SustainCERT SA	One Year
3 rd Verification	1-March-2024 – 30-September 2024	VCS	SustainCERT SA	0.584 Year (214 days)
Re-quantification	11-October-2021 to 30-September 2024	VCS	SustainCERT SA	2.97 Years (1,085 Days)

1.3 Sectoral Scope and Project Type

Sectoral scope	03 – Energy demand
Project activity type	Type II – Energy efficiency improvement projects

The project activity is designed as a Grouped Project Activity (GP) and includes multiple Project Activity Instances (PAIs) of the same activity type into one Grouped Activity. New instances can be introduced to the GP at any monitoring period, with a PAI defined as “Distribution of efficient cookstoves to a local community within a specific geographic and climatic region in the project boundary”.

1.4 Project Eligibility

1.4.1 General eligibility

² VM0050, Version-1.0

The Grouped Project Activity falls within the scope of the VCS Program. This is elaborated under the tables below.

Justification for GP's inclusion under the scope of the VCS Program and not excluded under Table 2.1 of the VCS Standard ver 4.7.

Table 1: VCS Program scope

S.No.	Scope	Applicability/ Justification
2.1.1		
1	The seven Kyoto Protocol greenhouse gases	The GP reduces GHG emissions associated with the combustion of cooking fuels. Gases included are CO ₂ , CH ₄ , N ₂ O.
2	Ozone-depleting substances (ODS)	The GP does not involve any ODS.
3	Project activities supported by a methodology approved under the VCS Program through the methodology development and review process	The ICS to be distributed in the GP applies the methodology "VM0050 "Energy Efficiency And Fuel-Switch Measures In Cookstoves", Version 1.0." which is a VCS approved methodology.
4	Project activities supported by a methodology approved under an approved GHG program, unless explicitly excluded (see the Verra website for exclusions).	Not applicable.
5	Jurisdictional REDD+ programs and nested REDD+ projects as set out in the Jurisdictional and Nested REDD+ (JNR) Requirements.	NA. The grouped project does not involve REDD+.
2.1.2	The scope of the VCS Program excludes projects that can reasonably be assumed to have generated GHG emissions primarily for the purpose of their subsequent reduction, removal, or destruction.	NA, the grouped project reduces existing emissions from traditional biomass stoves, which would persist without intervention. Improved cookstoves lower fuel use, cut GHG emission, improve health. Unlike excluded projects, it addresses an existing issue, ensuring genuine and verifiable emission reductions.

Table 2: Excluded project activities under the VCS Program

Excluded Activity	Applicability
Grid-connected electricity generation activities using hydroelectric power plants. The exclusion does not apply to ocean energy (e.g., wave, tidal, salinity gradient, and ocean thermal energy conversion). For hydro projects, large scale means a maximum capacity of greater than 15MW, where maximum capacity is the installed/rated capacity or authorized capacity (as determined in the activity approval from the project regulator, government, or similar entity), whichever is lower.	N/A. The GP activities are energy efficiency measures and do not generate electricity from hydro-power plants/units.

Grid-connected means >50% of total generation is exported to a national or regional grid. See the VCS Program document VCS Program Definitions for the full definition.	
Grid-connected electricity generation activities using wind, geothermal, or solar photovoltaic (PV) power plants. The exclusion does not apply to concentrated solar thermal-to-electricity, floating solar PV, or energy storage systems (e.g., batteries). Grid-connected means >50% of total generation is exported to a national or regional grid. See the VCS Program document VCS Program Definitions for the full definition.	N/A. The GP activities are energy efficiency measures and do not generate electricity from wind, geothermal, or solar power plants/units.
Activities recovering waste heat for combined cycle electricity generation, or to heat/cool via cogeneration or trigeneration. The exclusion does not apply to waste gas recovery or electricity generation using waste heat recovery outside of combined cycle applications (e.g., organic Rankine cycles).	N/A. The GP activities are energy efficiency measures and do not utilize recovered waste heat for any purposes.
Activities generating electricity and/or thermal energy for industrial use from the combustion of non-renewable biomass, agro-residue biomass, or forest residue biomass. The exclusion does not apply to gasification, pyrolysis, combusting biofuels, biogas, fractions of renewable biomass in refuse- derived fuels, agro/forest biomass residues in waste streams that are sent to landfills, CO ₂ capture and storage from renewable biomass combustion, or thermal efficiency improvements (e.g., cook stoves).	As the GP activities are distribution of improved cook stoves in Rwanda to improve thermal efficiency of cook stoves used for cooking purpose. The exclusion does not apply to thermal efficiency projects i.e. cook stoves, further the project activity is located in LDC.
Activities generating electricity and/or thermal energy using fossil fuels, and activities that involve switching from a higher to a lower carbon content fossil fuel. The exclusion does not apply to the use of captured flare and/or vent gas or waste containing previously used petroleum products (e.g., used plastics, oils, lubricants).	N/A. The GP activities are energy efficiency measures and do not generate electricity and/or thermal energy using fossil fuels, neither involve fossil fuel switch. The GP includes energy efficiency improvements in thermal applications, i.e. cookstoves.
Activities replacing electric lighting with more energy-efficient electric lighting, such as the replacement of incandescent electrical bulbs with compact fluorescent lights (CFLs) or light emitting diodes (LEDs). Large-scale means energy-efficient improvements with a maximum savings greater than 60 GWh/year or emission reduction greater than 60 kt CO ₂ e per year.	N/A. The GP activities does not include the replacement of electric lighting.
Activities installing and/or replacing electricity transmission lines and/or energy-efficient transformers.	N/A. The GP activities do not include the installation and/or replacement of electricity transmission lines and/or energy efficient transformers.

Large-scale means energy-efficient improvements with a maximum savings greater than 60 GWh/year or emission reduction greater than 60 kt CO ₂ e per year.	
Activities that reduce hydrofluorocarbon-23 (HFC-23) emissions	N/A. The GP reduces GHG emissions associated with the combustion of cooking fuels.

Requirements related to the pipeline listing deadline, the opening meeting with the validation/verification body, and the validation deadline:

Reference to VCS Standard version 4.7	Requirement	Justification
3.8.1	Non-AFOLU projects shall complete validation within two years of the project start date. Additional time is granted for non-AFOLU projects to complete validation where they are applying a new VCS methodology. Specifically, projects using a new VCS methodology and completing validation within two years of the approval of the methodology by Verra may complete validation within four years of the project start date.	The project is already registered under VCS. This version of the VCS PD corresponds to the application of VM 0050 v1.0.
4.1.5	The validation/verification body shall ensure that the project is listed on the project pipeline with a status of under validation before the opening meeting with the project proponent, such opening meeting representing the beginning of the validation process.	The project is already registered under VCS. This version of the VCS PD corresponds to the application of VM 0050 v1.0.

Eligibility of applied methodology under the VCS Program:

The project applies VM0050 (Energy Efficiency and Fuel-Switch Measures in Cookstoves, Version 1.0), an approved methodology under the VCS Program. As VM0050 does not impose any scale or capacity limits, the project is not subject to restrictions on its size or the number of cookstoves distributed. Additionally, the project is implemented as a Grouped Project with clearly defined geographic and technical criteria, ensuring it is not a fragmented part of a larger activity.

Compliance with the general requirements is described below:

Reference to VCS Standard version 4.7	Requirement	Justification
3.1.1	Projects shall meet all applicable rules and requirements set out under the VCS Program, including this document. Projects shall be guided by the principles set out in Section 2.2.1.	The grouped project meets all applicable rules and requirements as set out under the VCS Program and is guided by the ISO 14064-2:2006
3.1.2	Projects shall apply methodologies eligible under the VCS Program. Methodologies shall be applied in full, including the full application of any tools or modules referred to by a methodology, noting the exception set out in Section 3.14.1.	The grouped project applies VCS approved methodology VM0050, version 1.0 along with tools or modules as applicable, ensuring full compliance.

3.1.3	Projects shall apply the latest version of the applicable methodology in all cases unless a grace period applies to the project as set out in 3.22. Projects shall update to the latest version of the methodology when reassessing the baseline or renewing a crediting period.	The grouped project applies the latest version 1.0 of VCS approved methodology VM0050. Refer to section 3 of the PD below for more details.
3.1.4	Projects and the implementation of project activities shall not lead to the violation of any applicable law, regardless of whether or not the law is enforced.	The grouped project and its instances shall remain in compliance with the applicable local laws. This has also been made an eligibility criterion for inclusion of project activity instances into the grouped project.
3.1.5	Where projects apply methodologies that permit the project proponent its own choice of model, such model shall meet with the requirements set out in the VCS Program document VCS Methodology Requirements and it shall be demonstrated at validation that the model is appropriate to the project circumstances (i.e., use of the model will lead to an appropriate quantification of GHG emission reductions or removals).	Not applicable. The PP has applied the model presented in the applied methodology VM0050 version 1.0
3.1.6	Where projects apply methodologies that permit the project proponent to choose a third-party default factor or standard to ascertain GHG emission data and any supporting data for establishing baseline scenarios and demonstrating additionality, such default factor or standard shall meet with the requirements set out in the VCS Program document VCS Methodology Requirements.	Not applicable. The applied methodology, VM0050 version 1.0 , does not allow for the selection of alternative models. The project proponent has followed the prescribed model outlined in the methodology.
3.1.7	Where the rules and requirements under an approved GHG program conflict with the rules and requirements of the VCS Program, the rules and requirements of the VCS Program shall take precedence.	The project activity applies VCS methodology and so this is not applicable.
3.1.8	Where projects apply methodologies from approved GHG programs, they shall conform with any specified capacity limits and any other relevant requirements set out with respect to the application of the methodology and/or tools referenced by the methodology under those programs.	The project activity applies VCS methodology i.e., VM0050 version 1.0 that does not specify any capacity limit.
3.1.9	Where Verra issues new VCS Program rules, the effective dates of these requirements are set out in Appendix 3 of VCS standard ver 4.7 and Effective Dates or equivalent for other program	The grouped project will adhere to the new VCS Program rules, and the effective dates of these requirements set out in Appendix 3 of VCS standard ver 4.7.

	documents and are listed in a companion Summary of Effective Dates document which corresponds with each update.	
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Eligibility as per section 1.1 of VCS Methodology Change and Re-quantification Procedure

Eligibility Criteria	Justification
1. The project meets all the applicability conditions of the most recent version of a different active methodology or the most recent version of the methodology used in a previously approved verification request.	The project applies the latest VCS methodology and fully complies with all the specified requirements.
2. The project proponent has all the data required to apply the new methodology. Applying a methodology deviation to circumvent having the required data is not permitted.	The project proponent has all the necessary data to apply the new methodology and does not intend to seek a methodology deviation to circumvent or bypass these requirements.
3. The verification periods being re-quantified are consecutive.	The grouped project's previous verification periods are sequential without any interruptions.
4. There are active VCUs on the Verra Registry for the period(s) being re-quantified.	The grouped project has active verified carbon units (VCUs) recorded in the Verra Registry for the periods under re-quantification.

1.4.2 AFOLU project eligibility

Not Applicable – This is not an AFOLU project, as the project involves the distribution of improved cookstoves.

1.4.3 Transfer project eligibility

Not Applicable - As the project is exclusively listed under the VCS Program.

1.5 Project Design

The project has been designed to include distribution of ICS units to individual households, under multiple project activity instances within a grouped project.

1.5.1 Grouped project design

Being a Grouped Project Activity, this project will be implemented while fulfilling the eligibility criteria provided in the Table below.

Eligibility criteria as per section 3.6.10 to 3.6.15 of the VCS Standard v4.7

Criterion	How the new project activity instances comply	Evidence
3.6.10 Grouped projects shall specify one or more clearly defined geographic areas within which project activity instances may be developed. Such geographic areas shall be specified using	Each PAI will have clearly defined geographic areas and such area will be specified using geodetic polygons.	Each PAI will be implemented in Rwanda. PP has submitted geodetic polygons for the GP to VVB and added details in section 1.13 of the PD below.

Criterion	How the new project activity instances comply	Evidence
geodetic polygons		
3.6.11 Determination of baseline scenario and demonstration of additionality are based upon the initial project activity instances. The initial project activity instances are those that are included in the project description at validation and shall include all project activity instances currently implemented on the issue date of the project description.	Baseline scenario and demonstration of additionality shall be based upon the initial project activity instances	Baseline scenario and additionality has been demonstrated for the overall GP which is included at the time of validation in section 3.4 and 3.5 of the VCS-PD below.
3.6.12 Where a grouped project includes multiple project activities, the project description shall designate which project activities may occur in each geographic area.	The project activity(ies) that are included in GP shall define their geographic area in project description section of the VCS PD, and/or Joint Project Description & Monitoring Report.	Each PAI includes distribution of improved cookstoves to households that are dependent on traditional cookstoves using woody biomass for cooking.
3.6.13 The baseline scenario for a project activity shall be determined for each designated geographic area, in accordance with the methodology applied to the project.	Baseline scenario for a project activity shall be determined for each designated geographic area, in accordance with the methodology applied to the project	Baseline scenario has been determined for overall GP for Rwanda. Details have been added in section 3.4 of the VCS PD below.
3.6.14 The additionality of the initial project activity instances shall be demonstrated for each designated geographic area, in accordance with the methodology applied to the project	Additionality for a project activity instance shall be determined for each designated geographic area, in accordance with the methodology applied to the grouped project.	Additionality has been determined as per the applied methodology for Rwanda being the only Geographical Area for the GP. Details have been added in section 3.5 of the VCS -PD below..
3.6.15 Where factors relevant to the determination of the baseline scenario or demonstration of additionality require assessment across a given area, the area shall be, at a minimum, the grouped project geographic area. Examples of such factors include, inter alia, common practice; laws, statutes, regulatory frameworks, or policies relevant to	All the factors relevant to the determination of baseline or demonstration of additionality shall be done for the geographical boundary of the grouped project	Assessment of baseline and demonstration of additionality for GP has been done for Rwanda. The baseline factors, regulatory surplus and additionality have been established using national level reports and data sources, and are applicable to the entire designated geographic area of Rwanda.

Criterion	How the new project activity instances comply	Evidence
demonstration of regulatory surplus; determination of regional grid emission factors; and historical deforestation and degradation rates		Details have been added in section 3.4.of the VCS-PD below

Eligibility criteria as per section 3.6.16 and 3.6.17 of the VCS Standard v4.7:

S No	Criterion	How the new project activity instances comply	Evidence
1	Project Activity Instances (PAIs) must meet the applicability conditions set out in the applied methodology.	PP shall demonstrate compliance with VM 0050 version 1.0 in the VCS PD as applicable.	VCS PD section 3.2 justifying the applicability criteria of applied methodology.
2	Use the technologies or measures specified in the project description.	Only ICS that conform with the GP description are to be distributed in the project. The ICS will be chosen to deliver a level of service at least equivalent to the baseline appliance.	Manufacturer's specifications. The ICS distribution under each PAI are Kuniokoa generation 2 stoves, which is as per technology description of the grouped project.
3	Apply the technologies or measures in the same manner as specified in the project description.	Only ICS that conform with the GP description are to be distributed in the project. The ICS will be chosen to deliver a level of service at least equivalent to the baseline appliance.	Manufacturer's specifications. The ICS distributed under each PAI reduces fuel wood consumption due to better thermal efficiency and replaces the baseline traditional stoves, the same can be checked with distribution record and sample survey results.
4	Are subject to the baseline scenario determined in the project description for the specified project activity and geographic area.	All new PAIs will be implemented only in regions within the geographic borders of Rwanda subject to the same baseline scenario determined in Section 3.4 in this Project Description. The geographical location of the project ICS can be traced through the information provided in	ICS Distribution database for each PAI records distribution (end user registration database) with clear delineation of project boundary i.e. host country of Rwanda is provided to the VVB for their reference.

S No	Criterion	How the new project activity instances comply	Evidence
		the distribution database, which includes the location data of the ICS distributed.	
5	Have characteristics with respect to additionality that are consistent with the initial instances for the specified project activity and geographic area.	All new PAIs will use the activity method for demonstration of additionality. Step 1: Regulatory Surplus There is no government mandated programme or policy in host country of this project ensuring the distribution of new project activity instances. Step 2: Positive List The inclusion of new project activity instances will comply with the positive list as it satisfies criterion 1 where it meets all the applicability conditions of the methodology. Where the project activity installs or distributes stoves at zero cost to the end-user and has no other source of revenue other than the sale of GHG credits, the project activity shall be deemed additional.	Step1: Regulatory Surplus There is no mandatory legal requirement for installation of cookstoves in households/ institutions of Rwanda. Step 2: Positive List Further, the PP distributing ICS free of cost to end users, hence there is no revenue stream than sale of VCUs, hence the project activity instances are automatically additional. The above can be checked with end user agreement and declaration from PP on the same. The PP will provide end user agreement and declaration to VVB to support free distribution of ICS.
6	Where a capacity limit applies to a project activity included in the project, no PAI shall exceed such limit. Further, no single cluster of project activity instances shall exceed the capacity limit, determined as follows: Each device that exceeds one percent of the capacity limit shall be identified. Such instances shall be divided into clusters, whereby	The GP does not have any specified capacity limits applicable, since there are no capacity limits defined within the applied methodology. Therefore, this eligibility criteria is not applicable.	N/A

S No	Criterion	How the new project activity instances comply	Evidence
	each cluster is comprised of any system of instances such that each instance is within one kilometer of at least one other instance in the cluster. Instances that are not within one kilometer of any other instance shall not be assigned to clusters. None of the clusters shall exceed the capacity limit and no further project activity instances shall be added to the project that would cause any of the clusters to exceed the capacity limit.		
Eligibility conditions specific to inclusion of New PAIs			
7	The new PAI must occur within one of the designated geographic areas specified in the project description	The distribution of the ICS will be based on a MoU signed with the Government of Rwanda, and therefore, the project activity only distributes to the beneficiaries that are provided in Ubudehe based list of the districts. There is no way this program/GP can distribute ICS in the boundaries of the neighbouring countries of Rwanda. This requires passing of the project ICS through customs and other procedural regulations.	1. The distribution database for each PAI. 2. The MoU with the Rwanda government The evidence in line with above is shared with VVB.
8	The new PAI must comply with at least one complete set of eligibility criteria for the inclusion of new project activity instances. Partial compliance with multiple sets of eligibility criteria is insufficient.	The eligibility criteria set must be complied by the PAIs at all points in time throughout the crediting period. If at any point, it is found that the PAI is not complying with the set of eligibility criteria, then it may be excluded from the crediting for the duration of the monitoring period, until it is able to demonstrate the compliance of the	The MR will act as the documentary compliance summary. However, for each specific eligibility criteria (as laid down above), the supporting evidence will be provided by the PP. All the PAIs meets the eligibility criteria for inclusion under grouped project activity as demonstrated below.

S No	Criterion	How the new project activity instances comply	Evidence
		eligibility criteria.	
9	The new PAI must be included in the monitoring report with sufficient technical, financial, geographic and other relevant information to demonstrate compliance with the applicable set of eligibility criteria and enable sampling by the validation/verification body.	The new PAI will include all the technical, financial, geographic and other relevant information related to the compliance of the applicable set of eligibility criteria & also enable sampling by the VVB.	The MR for the specific monitoring period will act as the supporting evidence for the stated condition/requirement. Each PAI are part of VCS grouped project validation/verification, hence no further assessment.
10	The new PAI must be validated at the time of verification against the applicable set of eligibility criteria.	The new PAI(s) shall be part of the monitoring, and therefore, will be validated against the criteria specified, by a VCS accredited/approved VVB.	The Verification Report based on the VCS template, shall be issued by the approved VVB. This will act as the supporting evidence against this requirement. Each PAI are part of VCS grouped project validation/verification, hence no further assessment.
11	The new PAI must have evidence of project ownership, in respect of each project activity instance, held by the project proponent from the respective start date of each project activity instance (i.e., the date upon which the project activity instance began reducing or removing GHG emissions).	The PAI related evidence on the project ownership will be in the form of a distribution end user receipt poster. This will be signed by the end user, and a photograph of him/her holding the poster along with the ICS will be saved in the PAI database.	1. A photograph of the PAI distribution first end user holding the poster along with the ICS. 2. A scan of the poster, showing the first distribution date. 3. The distribution database of the GP stating the start date. Waiver of carbon credits from the end users are submitted to the VVB.
12	The new PAI must have a start date that is the same as or later than the grouped project start date.	The new PAI will have a start date later than the GP start date.	This can be verified through the GP distribution database, wherein each new PAI can be verified for its start date. The start date of grouped project activity is same as

S No	Criterion	How the new project activity instances comply	Evidence
			start date of PAI. The distribution record are shared with VVB to support start date of PAI.
13	The new PAI must be eligible for crediting from the later of start date of the project activity instance or the start of the verification period in which they were added to the grouped project through to the end of the project crediting period (only).	The PAI will be only eligible for the crediting from its start date through to the end of the project crediting period (only).	1. The start date of the PAI can be checked through the distribution database. 2. The end date of the GP crediting shall be referenced from the VCS Project Registry webpage. 3. The overlap of monitoring periods may be checked through the previous monitoring reports (available publicly on VCS project registry webpage for those periods). Each PAI are eligible for crediting from the start date of the instance through to the end of the project crediting period
14	The new PAI shall not be or have been enrolled in another VCS project .	It will be ensured that the PAI that is being enrolled under the VCS GP was not previously enrolled under any other VCS project, and will not be enrolled under other VCS project if it is removed from the VCS GP.	Since, for each PAI project proponent is the implementer, no further approval is required, however for the cases, where implementer other than PP, an approval on the same shall be given by PP in order to include the instance into this grouped project.
15	The new PAI shall adhere to clustering requirement that states the project proponent shall include in a singular project all project activity instances within ten kilometers of another instance of the same project activity and with the same project proponent	It will be ensured that PAI included within 10 kilometers of another instance of the same project activity by the same PP is in a singular project	Each PAI involves distribution of improved cookstoves by same PP within 10 kilometers hence included in the same project. There are no other project instances by the same PP distributed within 10 kilometers for the same project activity.

1.6 Project Proponent

Organization name	DelAgua Health Rwanda (Voluntary) Limited (DHRV)
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1.7 Other Entities Involved in the Project

N/A. There are no other entities involved in this Grouped Project activity.

1.8 Ownership

DelAgua Health Rwanda (Voluntary) Limited is the owner of the VCS grouped project activity. During the distribution of the improved cookstoves, the participating households sign an end user agreement between customer and Delagua. The end user agreement has customer information, unique identification number, product details etc. The agreement follow the requirements of para 3.7.1 of the VCS Standard ver 4.4 which states the evidence to establish project ownership should be "An enforceable and irrevocable agreement with the holder of the statutory, property or contractual right in the plant, equipment or process that generates GHG emission reductions and/or removals which vests project ownership in the project proponent."

The agreement confirms that the ownership rights of the VERRA project and the carbon assets generated from this project lie with the project proponent. The customer under the End User Agreement "releases all rights to the greenhouse gas reductions and carbon credits produced by the use of the clean energy product in the favour of Delagua and agree to not sell or transfer the GHG or carbon credits to any other third party or use these credits for any other purposes This will be evidenced through the below:

- DelAgua has executed a Memorandum of Understanding with the Government of Rwanda, whereby DelAgua is assigned responsibility for managing and implementing the project and is recognized as the sole direct recipient of all carbon credits derived from it.
- Manufacturer agreements confirm that DelAgua is the sole owner of all technologies purchased under this project. These agreements further confirm the manufacturer's understanding that the carbon credits associated with use of the technologies shall be within the jurisdictions of DelAgua.

During the distribution of the ICS, the participating household will sign an End User Agreement to confirm that the ownership rights of the carbon assets generated from this project lie with the project proponent.

1.9 Project Start Date

Project start date	11-October-2021
Justification	Date of commissioning of first batch of ICS under grouped project.

1.10 Project Crediting Period

Crediting period	☒ <i>Seven years, twice renewable</i> ☐ <i>Ten years, fixed</i> ☐ <i>Other (state the selected crediting period and justify how it conforms with the VCS Program requirements)</i>
Start and end date of first or fixed crediting period	11-October-2021 to 10-October-2028

1.11 Project Scale and Estimated GHG Emission Reductions or Removals

- ☐ < 300,000 tCO₂e/year (project)
☒ ≥ 300,000 tCO₂e/year (large project)

Calendar year of crediting period	Estimated GHG emission reductions or removals (tCO ₂ e)
11 Oct 2021- 31 Dec 2021	350
01 Jan 2022-31 Dec-2022	1,179,567
01 Jan 2023-31 Dec-2023	1,729,420
01 Jan 2024-31 Dec-2024	1,729,420
01 Jan 2025-31 Dec-2025	2,619,206
01 Jan 2026-31 Dec-2026	2,705,308
01 Jan 2027-31 Dec-2027	2,792,820
01 Jan 2028-10 Oct-2028	2,108,128
Total estimated ERRs during the first or fixed crediting period	14,864,219
Total number of years	7
Average annual ERRs	2,123,460

1.12 Description of the Project Activity

Distribution plan:

The distribution of ICS will occur at centralized distribution points, where households from surrounding villages will be educated on the proper use and maintenance of the technologies. Shortly following the initial distribution, CHWs will visit each household that received a technology to deliver the training again, ensuring that all members of the household are aware of proper use and maintenance.

The ICS distribution is planned in close coordination with the local government offices, e.g. District Offices, Sector Offices, and so forth. There is a structured plan through which the distribution activity is scheduled and then implemented on ground.

Project activity description (including the technologies or measures employed) and how it/they will achieve net GHG emission reductions or removals. The project activity included in this project description is the distribution and installation of high efficiency ICS systems in PAIs within Rwanda.

The ICS units will be based on a “rocket stove” design which reduce GHG emissions from biomass burning through improved combustion efficiency of wood fuel and decreased wood fuel consumption. The project stoves improve heat transfer to cooking pots through the insulated walls and design of the stove top when compared to traditional cooking methods over open- and three-stone fires.

The project stoves directly decrease wood fuel demand and reduce the pressure from wood cutting within the project boundary. A 30-50% saving of firewood when compared to three-stone fire cooking has been reported in certain models. The time spent foraging for wood fuel is thereby also reduced, saving time for especially women to engage in other economic driven activities.

ICS technologies planned under the GP for distribution:

The grouped project includes dissemination of following woody biomass ICS³, besides others. Specification of the example ICS is given below

Model-1⁴

Name of the stove – Kuniokoa Generation 2
Stove manufacturer – Burn
Stove Type – Natural Draft
Body – Stainless Steel S
Stove height – 32.1 cm
Stove diameter – 28.2 cm
Thermal efficiency (with pot skirt) – 51.3%
Thermal efficiency (without pot skirt) – 43.4%
High Power Output – 2.9 KW
Stove lifetime – 10 years

³ The ICS listed are non-exhaustive. The ICS distributions are subject to potential customer demands and preferences. Other ICS models may be included in the Project subsequently, provided they meet the methodological requirement. This shall not be construed as a deviation or change from project description.

⁴ Manufacturer specification and third party lab report submitted to VVB

Figure 1: Kuniokoa Stove Model reference picture



Model-2⁵:

Name of the stove – SSM S32-X
 Stove manufacturer – SSM
 Stove Type – Natural draft
 Stove Body – Stainless Steel
 Stove height – 27 cm
 Stove diameter – 32 cm
 Thermal efficiency with Pot Skirt – 50.1%
 Thermal efficiency without Pot Skirt – 45.7%
 High Power Output – 2.9 KW
 Stove lifetime – 10 years

Figure 2: S32-X Stove Model reference picture



Model-3

Name of the stove – Ecoa wood Generation 3
 Stove manufacturer – Burn

⁵ Manufacturer specification and third party lab report submitted to VVB

Stove Type – Natural Draft
 Body – Stainless Steel
 Stove height – 28.5 cm
 Stove diameter – 26.9 cm
 Thermal efficiency (with pot skirt) – 52%
 Thermal efficiency (without pot skirt) – 45.5%
 High Power Output – 2.8 KW
 Stove lifetime – 10 years

Figure 3: Ecoa wood Generation 3 reference picture



List of main manufacturing/production technologies arrangements, systems and equipment involved.

Detailed application and information on the ICS technology that is going to be distributed under the new PAIs will be **described** in the upcoming MRs, elaborating the information under relevant section of the MR for the newly included PAIs. PP will source the best available technologies for distribution under the GP. At the time of re-quantification validation, 548,326 BURN Kuniokoa stoves had been distributed in rural areas of Rwanda as follows.

PAI-1: 24,941
 PAI-2: 250,019
 PAI-3: 99,411
 PAI-4: 24,641
 PAI-5: 99,471
 PAI-6: 49,843

The ICS model selection at PAI level will be based on key attributes such as thermal efficiency of minimum 25%, durability, cultural acceptability, and manufacturing quality and warranty. From time to time, requirement gathering will be done on a continuous basis, seeking comments from the end users (through monitoring surveys, feedback requests on call center, feedback via register available at different sites, and anonymous feedback through CHWs), and based on these user feedbacks, newer models will be introduced to the GP, and new PAIs will be designed to accommodate for their variability in terms of design, specifications, and geographies within the host country (wherever required).

It will be verified by the PP that the project technologies are, at a minimum, meeting the technical specifications and requirements set in the respective methodologies (under the eligibility criteria).

At present, DelAgua is sourcing the ICS from different manufacturers, deploying them at its central warehouse through imports, and then distributing them in a scheduled manner. Each distribution involves various steps, which are elaborated in the relevant section of this document. In this whole process, quality of the equipment being distributed will be checked on spot basis. Each lot of the distribution batch will undergo spot checks, as it is an integral part of Quality Assurance at DelAgua. The ICS units that will be found as faulty, will not be distributed to the end users. At present, only rocket stove models are planned for the

upcoming distribution PAIs, as their distribution is found both beneficial to the locals (usage and maintenance) as well as a successful one from the implementation point.

The types and levels of service

Level of Service:

PAIs will provide ICS based on the 'rocket stove' design, delivering a level of service at least equivalent to the baseline appliance (open fire used for household cooking).

Type of Service: The ICS technology will deliver a specified high-power thermal efficiency of at least 25% and evidenced by a manufacturer's specification and WBT certificate. This is a significant improvement on the baseline open fire thermal efficiency default of 15%.

List of facilities, systems and equipment in operation under the existing scenario prior to the implementation of the project.

Under the baseline scenario, households use non-renewable woody biomass for their fuel needs for cooking. The baseline appliance being replaced by the project is an open fire (typically based on the three-stone concept).

1.13 Project Location

For each PAI, the project boundary will be defined as being within the geographic borders of Rwanda. The project boundary for each Project Activity Instance is the physical, geographical location of the ICS distributed under it within the geographical boundaries of Rwanda. Also, each individual distribution under the project technology will record the geographical location related data (e.g. latitude/longitude data), which can be verified from the recorded data (monitoring surveys). KML files will be provided as supporting documents to demonstrate the extent and the geographical coverage of the PAIs within the GP. All the KML files will indicate the regions within the geographical boundaries of the host country Rwanda.

The project boundary is defined by the following GPS coordinates:

2° 50' 23.8992" S and 28° 51' 42.1452" E

1° 2' 50.82" N and 30° 53' 56.6592" E



Fig. Project Location

1.14 Conditions Prior to Project Initiation

The baseline scenario is the same as the conditions existing prior to the Grouped Project initiation.

Majority of people in the host country still use traditional cookstoves or open fires which consume a large amount of fuelwood. The project aims to reduce the environmental and social burdens caused by inefficient biomass cooking by introducing energy efficient cookstoves to the individual households. The current scenario as established is continuation to use traditional wood fuel- based stoves to meet thermal energy demand for cooking.

For further information regarding this, please refer Section 3.4 (Baseline Scenario) of this document.

1.15 Compliance with Laws, Statutes and Other Regulatory Frameworks

A review of the national energy policies of the Rwanda shows that there are no mandatory laws, policies or requirements mandating the use of ICS. Though the Government of Rwanda's (GoR) previous Energy Sector Strategic Plan identifies dissemination of improved cookstoves (ICS) as one way to reduce fuel wood consumption. The government promotes the use of improved ICS, however it's not mandatory.

Additionally, the latest Energy Sector Strategic Plan (2023/24)⁶ highlights the government's commitment to clean cooking initiatives, adoption of fuel-efficient cookstoves. The plan actively promotes modern, sustainable and improved cooking solutions by encouraging private sector participation to scale up efficient technologies, reduce deforestation, and minimize indoor air pollution.

The GP complies with applicable local laws and regulatory frameworks. Under Rwandan law and regulation, none of the activities or processes relating to the manufacture or distribution of Improved cookstoves require Environmental Impact Assessments not meet any of the screening criteria in Appendix 2, page 40 of the EIA guidelines⁷.

1.16 Double Counting and Participation under Other GHG Programs

1.16.1 No Double Issuance

Is the project receiving or seeking credit for reductions and removals from a project activity under another GHG program?

☐ Yes ☒ No

1.16.2 Registration in Other GHG Programs

Has the project registered under any other GHG programs?

☐ Yes ☒ No

1.16.3 Projects Rejected by Other GHG Programs

Has the project been rejected by any other GHG programs?

☐ Yes ☒ No

1.17 Double Claiming, Other Forms of Credit, and Scope 3 Emissions

1.17.1 No Double Claiming with Emissions Trading Programs or Binding Emission Limits

Are project reductions and removals or project activities also included in an emissions trading program or binding emission limit? See the *VCS Program Definitions* for definitions of emissions trading program and binding emission limit.

⁶ https://www.reg.rw/fileadmin/user_upload/Final_ESSP.pdf

⁷ General Guidelines and Procedure for Environmental Impact Assessment, Republic of Rwanda, November 2006 (See filename: RW_EIA_Guidelines_Final_versionI_Nov_2006)

☐ Yes ☒ No

If yes, provide all required evidence of no double claiming as outlined by the VCS Standard.

1.17.2 No Double Claiming with Other Forms of Environmental Credit

Has the project activity sought, received, or is planning to receive credit from another GHG-related environmental credit system? See the *VCS Program Definitions* for definition of GHG-related environmental credit system.

☐ Yes ☒ No

If yes, provide all required evidence of no double claiming as outlined by the VCS Standard.

1.17.3 Supply Chain (Scope 3) Emissions

Do the project activities specified in Section 0 affect the emissions footprint of any product(s) (goods or services) that are part of a supply chain?

☐ Yes ☒ No

If yes:

Is the project proponent(s) or authorized representative a buyer or seller of the product(s) (goods or services) that are part of a supply chain?

☐ Yes ☐ No

If yes:

Has the project proponent(s) or authorized representative posted a public statement on their website saying, "Carbon credits may be issued through Verified Carbon Standard project [project ID] for the greenhouse gas emission reductions or removals associated with [project proponent or authorized representative organization name(s)] [name of product(s) whose emissions footprint is changed by the project activities]."

☐ Yes ☐ No

If yes to all:

Provide evidence of the public statement. Evidence must be provided in this section or in an appendix.

1.18 Sustainable Development Contributions

The implementation of the GP will lead to the following Sustainable Development contributions:

The GP is contributing towards sustainability, which is also verifiable through the SDG indicators selected for the specific activities that are going to be monitored for their fulfilment.

Following sustainable contributions are part of the PAIs (Distribution of ICS in Rwanda):

1. **SDG-1: No Poverty**

Approach: For arriving at the indicator value, we monitor the relevant parameter for this SDG. In this case, the yardstick for access to basic services is kept at RWF 100,000/HH(household)/month. Based on DelAgua's experience in Rwanda, this is the value below which access to basic cooking services is not possible.

Relevant SDG Indicator: 1.4.1 Proportion of population living in households with access to basic services

Available Data: The parameter monitored to calculate the number of HHs living without access to basic services is the number of beneficiary HHs. This is because the number of HHs that are unable to purchase any improved cooking devices can be considered as the ones living without access to the basic services such as clean cooking. The list of HHs which are to be

distributed with the project ICS is provided by the government of Rwanda, and is based on the economic classification list of the population of Rwanda.

Monitoring Requirement(s): The new project ICS beneficiary/user are considered as living without the access to clean cooking, and the final value of number of such people using the project ICS will be considered towards the estimation of this SDG impact. Clean cooking is considered as a basic service, and access to it is an addition to the SDG impact.

2. SDG-3: Good Health and Well Being:

Approach: For arriving at the indicator value, we monitor the relevant parameter for this SDG, specifically the SDG indicator. This SDG relates to health, and DelAgua's project ICS is improving health for every individual who is receiving it.

Relevant SDG Indicator: 3.9.1 Mortality rate attributed to household and ambient air pollution

Available Data: Regarding indicator 3.9.1, at every project ICS beneficiary HHs, ones who are experiencing any improvement (or no improvement or deterioration) in their ambient air quality as compared to pre-project scenario will be considered as an input.

Monitoring Requirement(s): The data will be collected at the time of monitoring survey. Beneficiary HHs for VCS GP will be sampled for monitoring as per monitoring plan, and these are then requested to respond to survey questions, which will then be recorded within the monitoring survey database.

3. SDG-5: Gender Equality

Approach: In this case, the number of ICS beneficiary HHs will be questioned over their time spent for collecting fuel (firewood).

Relevant SDG Indicator: 5.4.1 Proportion of time spent on unpaid domestic and care work, by sex, age and location

Available Data: Monitoring Survey for VCS GP includes question on time spent on collection of fuel.

Monitoring Requirement(s): The value is recorded in the monitoring surveys, and then saved in the survey database.

4. SDG-7: Affordable and Clean Energy

Approach: For arriving at the indicator value, we will monitor the relevant parameter for this SDG, specifically the SDG indicator.

Relevant SDG Indicator: 7.1.2 Proportion of population with primary reliance on clean fuels and technology

Available Data:

Distribution Master Database includes the data for this, where each HH where project ICS is distributed, acts as an input. The data within the database is updated on a continuous basis.

Monitoring Requirement(s): Distribution Database is exported for the monitoring period, and then the number of beneficiary HHs are multiplied with the average HH size of Rwanda (which is 4.3 in 2021). This gives the number of people who are now benefiting from the clean and affordable energy for the Monitoring Period.

5. SDG-8: Decent Work and Economic Growth

Approach: For arriving at the indicator value, we will monitor the relevant parameter for this SDG, specifically the SDG indicator.

Relevant SDG Indicator: 8.3.1 Proportion of informal employment in total employment, by sector and sex

Available Data: The salary slips for the CHWs act as the data source since these are not on DelAgua's payrolls. However, there are different data sources (number of mobile phones assigned to individuals during distribution, number of CHWs trained for a specific distribution event), which are used to total the CHWs working for DelAgua.

Monitoring Requirement(s): This data is continuously collected and is obtained from Training and Account teams.

6. SDG-12: Ensure Sustainable consumption and production pattern

Approach: Here, each household is trained for sustainable practices, best usage practices for ICS usage, and utilization of fuel resources. Apart from this, the project being one of its kind, provides education and training to 5000+ Community Health Workers (CHWs) engaged with us for distribution and end-user engagement.

Relevant SDG Indicator: 12.8 By 2030, ensure that people everywhere have the relevant information and awareness for sustainable development and lifestyles in harmony with nature

Available Data:

(i) Number of project ICS beneficiary HHs who will be visited by DelAgua staff for HH visit surveys are used to calculate the parameter. This data is continuously recorded in the distribution master database.

(ii) Number of CHWs that were trained for the project activity implementation (distribution and surveys).

Monitoring Requirement(s): The distribution master database and the CHW training data is used to calculate the number of people trained under the project activity.

7. SDG-13: Climate Action

Approach: For this SDG, there are no separate monitoring requirements. We declare the GHG Emission Reductions achieved by project in the monitoring period. This is verified by a VCS accredited VVB, and the resultant VCUs are then issued, acting as the net impact contributed towards this SDG.

Relevant SDG Indicator: Not applicable.

Available Data: This can be accessed from the Monitoring Reports that are publicly available.

Monitoring Requirement(s): All the monitoring requirements are already detailed in the Monitoring Reports and corresponding ER Sheets.

8. SDG-15: Life on Land

Approach: For arriving at the indicator value, we monitor the relevant parameter for this SDG, specifically the SDG indicator.

Relevant SDG Indicator: 15.4.2 Mountain Green Cover Index

Available Data: (i) Baseline (pre-project) survey data, (ii) Monitoring Surveys (periodic), (ii) Registered PD&MR and ER Sheet

Monitoring Requirement(s): This parameter is fixed for per HH level firewood consumption, which is then multiplied with monitored values (such as usage rate), other relevant values as per the equations provided in the methodology applied for VCS GP. Based on the calculations, per HH level firewood savings are calculated

1.19 Additional Information Relevant to the Project

1.19.1 Leakage Management

Not applicable as the project adopts a net gross adjustment factor of 95% to account for leakage.

1.19.2 Commercially Sensitive Information

No commercially sensitive information has been excluded from the public version of the project description.

1.19.3 Further Information

N/A as there is no other bearing on the eligibility of the project.

2 SAFEGUARDS AND STAKEHOLDER ENGAGEMENT

2.1 Stakeholder Engagement and Consultation

2.1.1 Stakeholder Identification

Stakeholder Identification	The program identified stakeholders through geographic and socioeconomic assessments, consultations with local authorities, and outreach to NGOs and government representatives. The identified stakeholders include local communities (ICS beneficiaries), NGOs, environmental organizations, government representatives, academia, and project developers etc.
Legal or customary tenure/access rights	Not applicable, the program involves distribution of ICS to individual households at their discretion and in the context of this grouped project, there are no legal or customary tenure/access rights to territories and resources, including collective and conflicting rights, held by stakeholders, indigenous people (IPs), local communities (LCs), or customary rights holders.
Stakeholder diversity and changes over time	The project's stakeholders include local communities, NGOs, government representatives, academia, and project developers, each with diverse social, economic, and cultural backgrounds. Local communities, primarily low-income households, benefit directly from improved cookstoves, while NGOs and government bodies support program implementation. Over time, there have been no significant changes in the composition of stakeholder groups.
Expected changes in well-being	The program enhances health by reducing indoor air pollution, improves economic well-being by increasing access to clean cooking and creating job opportunities, and supports ecosystem conservation by reducing firewood consumption and lowering emissions. These benefits contribute to poverty reduction, gender

	empowerment, and long-term environmental sustainability, ensuring positive impacts for stakeholders over time
Location of stakeholders	The people impacted by the program include ICS beneficiaries and those employed through the program. The impacts of the improved cookstoves are localized, and areas outside the grouped project boundary are not expected to be affected.
Location of resources	The program involves distribution of ICS to individual households and communities, and it does not interfere with rights to lands, territories and/ or resources. The program results in reduction in demand of biomass fuel in the region by putting less pressure on forests and conserves the resources on the customary land of stakeholders.

2.1.2 Stakeholder Consultation and Ongoing Communication

Date of stakeholder consultation	01-March-2023
Stakeholder engagement process	The program engaged stakeholders through newspaper ads, emails, and radio announcements before the LSC meeting on 1st March 2023. The meeting was held from 9:00 AM to 11:00 AM at Gorillas Golf Hotel, Nyautarama, Rwanda, ensuring gender-inclusive participation. Sessions included program presentations, cookstove demonstrations, and open discussions. Outcomes were documented through photos, videos, attendance records, written feedback and were shared with VVB for validation.
Consultation outcome	Stakeholders were consulted for the grouped project design and implementation. The discussion covered potential risks, costs, and benefits, emphasizing the positive impact of improved cookstoves on health, environment, and household savings. The program complies with all relevant labor laws in the host country, ensuring fair wages, equal opportunities, and worker protection. Free, Prior, and Informed Consent (FPIC) was respected, with stakeholders fully informed about the program, ensuring no infringement on property rights.



The VCS validation and verification process was explained, covering public consultation, monitoring, and third-party assessment to ensure compliance with standards.



Ongoing communication

The project ensures continuous engagement with stakeholders through multiple communication channels.

- **Call Center Support** – A dedicated DelAgua call center assists stakeholders in Kinyarwanda, English, and French.
- **Email Communication** – Stakeholders can directly contact DelAgua through the official email address for inquiries and feedback.
- **Community Health Workers (CHWs)** – As trusted community representatives, CHWs act as a primary point of contact for stakeholders, ensuring accessibility and effective communication.
- **Follow-Up Visits** – DelAgua staff conduct regular household visits to monitor progress, address concerns, and ensure the proper use of distributed cookstoves

Stakeholder input

All stakeholder input received during the consultation was carefully reviewed. Feedback was addressed through clarifications on project benefits, distribution areas, and implementation details.

Below are the queries raised by the attendees

Q.1. Whether current grouped project activity of DelAgua involves only improved cookstove distribution?

Ans: The project activity involves only Improved cookstove distribution.

Q.2. Which districts/region the project is planned under the current project activity?

Ans: The PP representative explained that the project boundary for the grouped project activity is host country Rwanda and various

	districts will be targeted where ICS penetration is still less or not there. Q.3. Whether any changes in ICS models to be used under current project than ICS distributed under other ongoing projects as DelAgua group is already having other registered projects and distributing ICS from past many years. Ans: The technology upgrades with time and PP uses the state-of-the-art ICS technology available at the time of start of the grouped project activity, under current project the PP is distributing Burn make Kuniokoa generation 2 and S32 models which are having more than 50% thermal efficiency. No updates to the project design were necessary, as stakeholders expressed support for the project, and no concerns were raised.
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2.1.3 Free Prior and Informed Consent

Obtaining consent	Prior to commencing the project, DelAgua signed a Memorandum of Understanding with Ministry of Environment to distribute improved cookstoves to rural households across Rwanda. Following this, DelAgua has signed Collaboration Agreements with the districts that the project has been delivered in (to date.) These agreements help the population in protecting the environment by scaling down firewood consumption while reducing indoor air pollution leading to improved respiratory health. Prior to distribution all potential ICS recipients are gathered to introduce the project. They are invited to receive a ICS free of charge. All recipients must consent to receive an ICS by attending a distribution day and signing the agreement on the bottom of the DelAgua poster.
Outcome of FPIC	The FPIC process ensured that all stakeholders were fully informed before establishing a transparent agreement. Beneficiaries voluntarily agreed to transfer carbon credit ownership at the time of ICS distribution. The project did not encroach on land, relocate people, or cause physical or economic displacement. Instead, it provides ICS for clean cooking, creates job opportunities, and improves health and environmental outcomes. The Project Proponent (PP) retains full and uncontested rights to the carbon credits generated from the use of project ICS.

2.1.4 Grievance Redress Procedure

Development process	The grievance redress procedure was developed to ensure that local stakeholders have accessible and culturally appropriate channels to raise concerns. The process includes receiving, hearing, responding to, and resolving grievances within a reasonable time frame. Various communication methods have been established to accommodate different stakeholder needs, especially considering rural communities with limited phone access as stated below.
Grievance redress procedure	To address continuous grievances from local stakeholders, measures have been put in place to allow grievances to be reported through multiple channels:

	1. Toll-Free Helpline – DelAgua provides a toll-free helpline for stakeholders to connect and seek assistance. 2. Community Health Worker (CHW) Network – The CHW network collects feedback directly from end users and local authorities. This method is widely used as many rural Rwandans lack phone access. 3. Written Submissions via Local Government Offices – During stove distribution, end users are informed that they can submit written feedback to the nearest cell office, where it will be relayed to DelAgua through government officials. These mechanisms ensure that grievances are received, documented, and addressed in a structured and transparent manner.
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2.1.5 Public Comments

Comments received	Actions taken
There were no comments received during public comment period from 17 March 2023 to 16 April 2023 on VERRA website.	No comments were received during the public comment period, therefore, no actions or project design updates were necessary.

2.2 Risks to Stakeholders and the Environment

2.2.1 Management Experience

DelAgua has been delivering cookstove projects for over 10-years and has several active projects listed under VERRA. DelAgua does not sub-contract any of the implementation of this project to non-DelAgua entities. Thus, DelAgua management teams have expertise or experience in implementing similar project activities and engaging communities.

The operational management team for this project are Rwandan nationals with deep experience of rural delivery of services and government engagement.

Senior management of DelAgua manage multiple projects across multiple jurisdictions with deep experience in Carbon Methodologies, Research, Data Analysis and management of large-scale development projects. DelAgua staff are well-trained, with prior experience in distribution and monitoring. They received training on the questionnaire before conducting the surveys.

2.2.2 Risk Assessment

	Risks identified	Mitigation or preventative measure(s) taken
Natural and human-induced risks to stakeholders' wellbeing	No risk identified	These ICS are manufactured with safety protocols as per standardized design and material specifications to ensure proper functioning and user protection. The transition to project ICS from traditional cooking technology offers a sustainable and safe alternative to meeting the energy demand, enhancing environmental and health benefits without introducing new risks.
Risks to stakeholder participation	No risk identified	Not Applicable, on the contrary the project will contribute to the social, economic and environmental development of the stakeholders that are directly or indirectly impacted by the grouped project.
Working conditions	No risk identified	Not Applicable, PPs foster an environment of mutual respect where employees and partners can work

		together without fear of harassment, discrimination, or infringement on human rights. To ensure the above, • DelAgua maintains a health, safety & security policy for all staff in Rwanda. • In addition, DelAgua maintains a risk register (as part of an overall risk management policy) that tracks all risk types (in addition to safety and security.) • This is updated on a quarterly basis.
Safety of women and girls	No risk identified	Not Applicable, as the ICSs are installed in the kitchen of beneficiary and in most of the households the responsibility of cooking / fuel collection lies with the women and girls. With project ICS, the beneficiary women and children are relieved from the drudgery of fuel collection (safety risk) and prolonged and sustained exposure to IAP (health risk) by virtue of the increased efficiency and design of the project ICS. • Additionally, DelAgua ensures all staff follow a clear Code of Conduct that they sign up to upon recruitment. This policy is regularly updated and enforced. • Toll Free number exists within Rwanda and a clear whistleblowing policy is adhered to for any grievances raised. • Training includes modules on safety and security. • All surveys must first gain consent of the respondent. This individual must be above 18 or the survey is immediately ended.
Safety of minority and marginalized groups, including children	No risk identified	Not Applicable, the project does not involve any activities that compromise the safety of minority and marginalized groups, (including children). On the contrary it leads to the Sustainable development of the community. DelAgua maintains a policy on child labour which all staff, suppliers and vendors are required to adhere to. This policy is regularly updated and enforced.
Pollutants (air, noise, discharges to water, generation of waste, and release of hazardous materials and chemical pesticides and fertilizers)	No risk identified	Not Applicable, the project does not involve the trade, release, and/ or use of hazardous chemicals and/or materials. Instead, the ICS are going to decrease the GHG emission levels attributed to improved performance and design of the project ICSs. The project intervention includes replacement of baseline stoves with improved project ICS.

2.3 Respect for Human Rights and Equity

2.3.1 Labor and Work

	Risks identified ⁸	Mitigation or preventative measure(s) taken
Discrimination	No risk identified	PPs foster an environment of mutual respect where employees and business partners can work together without fear of harassment, discrimination, or infringement on human rights. The project does not endorse any form of discrimination based on gender, sexual orientation, religion, race etc. PPs have implemented relevant policies to make sure that no discrimination based on gender, race, religion, sexual orientation, or other habits or sexual harassment with respect to the project.
Sexual harassment	No risk identified	Please refer above
Equal pay for equal work	No risk identified	PPs do not discriminate based on gender and promote equal work for equal pay. PP further confirms that the average wages / remunerations paid to the employees working with PPs is at / above par with the industry standards and in compliance with the minimum wage rate prescribed by the state / local government regulations.
Gender equity in labor and work	No risk identified	Please refer above
Forced labor	No risk identified	The PPs neither endorse nor is involved in child labor, the exploitation of human trafficking victims, or the utilization of forced labor. PPs have relevant policies to make sure that no such workplace risks exist.
Child labor	No risk identified	Please refer above
Human trafficking	No risk identified	Please refer above

2.3.2 Human Rights

Risks identified	Mitigation or preventative measure(s) taken
No risk identified	The distribution and use of Improved Cookstoves (ICSs) do not infringe upon the rights of Indigenous Peoples (IPs), Local Communities (LCs), or customary rights holders, as outlined in international human rights law, the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP), and ILO Convention 169 on Indigenous and Tribal Peoples. ICSs are fully portable, require no land acquisition or infrastructure modifications, and do not interfere with traditional resource use or customary land tenure systems. Furthermore, the implementation of the project is voluntary, ensuring that communities retain full autonomy in decision-making regarding stove adoption. The project aligns with the principles of Free, Prior, and Informed Consent (FPIC), respecting the self-determination and cultural practices of IPs and LCs while contributing to improved health and environmental benefits.

⁸ The identified risks and commensurate mitigation or preventative measure(s) for forced labor, child labor, and human trafficking, must be inclusive of staff and contracted workers employed by third parties.

2.3.3 Indigenous Peoples and Cultural Heritage

Risks identified	Mitigation(s) or preventative measure taken
No risk identified	The Improved Cookstoves (ICSs) are designed for household use and are fully portable, meaning they do not require land acquisition, displacement, or any physical modifications to existing infrastructure. As a result, their deployment does not interfere with the rights of Indigenous Peoples (IPs), Local Communities (LCs), or customary rights holders over land, resources, or cultural heritage. Additionally, the use of ICSs does not impact sites, structures, or objects of historical, cultural, artistic, traditional, or religious significance, nor does it disrupt intangible cultural heritage, such as traditional cooking customs. Instead, the technology enhances traditional cooking practices by improving efficiency and reducing emissions, aligning with sustainable development goals while fully respecting cultural heritage and community rights.

2.3.4 Property Rights

Risks identified	Mitigation or preventative measure(s) taken
No risk identified	The distribution and use of Improved Cookstoves (ICSs) do not interfere with the property rights, legal or customary tenure, or access rights of Indigenous Peoples (IPs), Local Communities (LCs), or customary rights holders. The ICSs are fully portable and do not require land acquisition, displacement, or modifications to communal or individually held territories, properties, or resources. Additionally, the project does not impose any restrictions on customary land use or access to natural resources. As the adoption of ICSs is entirely voluntary, stakeholders retain full autonomy in their decision-making, ensuring no infringement on collective or conflicting tenure rights. The project aligns with applicable legal frameworks and customary norms, supporting sustainable development without disrupting existing rights or claims.

2.3.5 Benefit Sharing

Process used to design the benefit sharing plan	Not applicable, the project does not impact the property rights, legal or customary tenure, or access rights of Indigenous Peoples (IPs), Local Communities (LCs), or customary rights holders, as described in above section 2.3.4.
Summary of the benefit sharing plan	Not applicable, the project involves distribution of improved cookstoves to individual households and communities. Further, the beneficiaries are being provided with the project stove free of cost against the transfer of ownership of credits to the PP.
Approval and dissemination of benefit sharing plan	The project involves the distribution of Improved Cookstoves (ICSs) to individual households and communities. Beneficiaries receive the project stoves free of cost in exchange for the transfer of ownership of carbon credits to the Project Proponent (PP) via a transfer agreement. As the project does not impact property rights, legal or customary tenure, or access rights, there are no affected stakeholder groups requiring a benefit-sharing agreement.

2.4 Ecosystem Health

	Risks identified	Mitigation or preventative measure(s) taken
Impacts on biodiversity and ecosystems	No risk identified	The ICSs decreases the GHG emission levels attributed to improved performance and design of the project ICSs. It does not involve change in baseline fuel or any other major interventions that negatively impacts biodiversity or ecosystems. Thus, the project does not affect or alter any largely intact or High Conservation Value (HCV) ecosystems, critical habitats, landscapes, key biodiversity areas or sites identified.
Soil degradation and soil erosion	No risk identified	The project shall result in reduction in demand of biomass fuel in the region reducing pressure on forests for deforestation and will hence indirectly avoid erosion associated with tree cutting/ felling.
Water consumption and stress	No risk identified	The fuel type in project ICS is same as that in the baseline scenario. Since there is no fuel change, albeit much reduced in volume attributed to ICS efficiency, there are no potential impacts on natural or pre-existing pattern of watercourses, groundwater and/or the watershed(s) such as high seasonal flow variability, flooding potential, lack of aquatic connectivity or water scarcity.

2.4.1 Rare, Threatened, and Endangered Species

Is the project located in or adjacent to habitats for rare, threatened, or endangered species?

☐ Yes

☒ No.

Species and habitat	Not applicable, the project ICS have no relevance to be located in, or adjacent to habitats for rare, threatened, or endangered species. Areas needed for habitat connectivity Not applicable, the project is not located in, or adjacent to habitats for rare, threatened, or endangered species
Areas needed for habitat connectivity	Not applicable, the project ICS have no relevance to be located in, or adjacent to habitats for rare, threatened, or endangered species. Areas needed for habitat connectivity Not applicable, the project is not located in, or adjacent to habitats for rare, threatened, or endangered species

	Risks identified	Mitigation or preventative measure(s) taken
Habitats for rare, threatened, and endangered species	No risk identified	Not applicable, the project is not located in, or adjacent to habitats for rare, threatened, or endangered species.
Areas for habitat connectivity	No risk identified	Not applicable, the grouped project is not located in, or

adjacent to habitats for rare, threatened, or endangered species.

2.4.2 Introduction of Species

Species introduced	Classification	Justification for use	Adverse effects and mitigation
None	NA	NA	NA

Existing invasive species	Mitigation measures to prevent the spread or continued existence of invasive species
None	NA

	Risks identified	Mitigation or preventative measure(s) taken
Invasive species	No risk identified	Not applicable, the project does not involve introduction of any species.

2.4.3 Ecosystem Conversion

	Risks identified	Mitigation or preventative measure(s) taken
Ecosystem conversion	No risk identified	Not applicable, the grouped project is not an ARR, ALM, WRC or ACoGS grouped project.

3 APPLICATION OF METHODOLOGY

3.1 Title and Reference of Methodology

The Grouped Project activity will involve PAIs that will apply the following methodology and tool, approved under VERRA:

Type (methodology, tool or module).	Reference ID, if applicable	Title	Version
Methodology	VM0050	Energy Efficiency and Fuel-Switch Measures in Cookstoves https://verra.org/wp-content/uploads/2024/10/VM0050-EE-and-Fuel-Switch-Measures-in-Cookstoves-v1.0.pdf	1.0
TOOL	TOOL30	Calculation of the fraction of non-renewable biomass	4.0

Protocol	KPT	https://cdm.unfccc.int/methodologies/PA/methodologies/tools/am-tool-30-v4.0.pdf Kitchen Performance Test (KPT)	4.0
Protocol	WBT	https://cleancooking.org/binary-data/DOCUMENT/file/000/000/604-1.pdf Water Boiling Test Protocol	4.2.3
Clarification/corrections	-	https://cleancooking.org/binary-data/DOCUMENT/file/000/000/399-1.pdf CORRECTION AND CLARIFICATIONS TO VM0050 ENERGY EFFICIENCY AND FUEL SWITCH MEASURES IN COOKSTOVES, V1.0 Dated: 03 February 2025 https://verra.org/wp-content/uploads/2025/02/CC_VM0050_v1.0_Feb2025.pdf	-

In the context of applied methodology, the associated guideline documents applicable for the Grouped Project include:

- CDM Guideline “Sampling and surveys of CDM project activities and programmes of activities” version 04;⁹
- CDM Standard “Sampling and surveys for CDM project activities and programmes of activities” version 09.¹⁰

3.2 Applicability of Methodology

The applicability criteria of the methodologies and tools used are justified at the project activity level. This is reflected in the table below.

The applicability of methodology VM0050 is justified as below:

Methodology ID	Applicability condition	Justification of compliance
VM0050	Replacement of non-renewable biomass (e.g., firewood, charcoal)-fired cookstoves with: i. More efficient project devices that use the same fuel as in the baseline. ii. Efficient project devices fired by renewable biomass or bioethanol. iii. Efficient project devices fired by liquefied petroleum gas (LPG); or iv. Electric-powered project devices.	The project replaces non-renewable biomass-fired traditional cookstoves with more efficient improved cookstoves (ICSs). All ICSs distributed or planned to be distributed under the project have a thermal efficiency significantly higher than the baseline traditional cookstoves.
VM0050	Replacement of solid or liquid fossil fuel (e.g., coal, kerosene)-fired cookstoves with any of the following:	Not applicable, since the ICSs involved in the project replaces traditional biomass-fueled cookstoves rather than solid or

⁹ https://cdm.unfccc.int/sunsetcms/storage/contents/stored-file-20151023152925068/Meth_GC48_%28ver04.0%29.pdf

¹⁰ https://cdm.unfccc.int/sunsetcms/storage/contents/stored-file-20210531160756223/Meth_Stan05.pdf

	i. Efficient project devices fired by renewable biomass or bioethanol ii. Efficient project devices fired by LPG; or iii. Electric-powered project devices.	liquid fossil fuel-fired cookstoves. The project focuses on improving the efficiency of biomass-based cooking rather than transitioning from fossil fuel use.
VM0050	Project devices are used in households, communities, institutions, or small or medium enterprises (SMEs), ⁴ collectively referred to in this methodology as the “target population.	All ICSs involved in the project are used in domestic premises, i.e., households and communities. As the project devices are exclusively deployed within households for daily cooking activities, the project aligns with the definition of the “target population” as specified in the methodology.
VM0050	Where renewable biomass is used, it is exclusively renewable and qualifies as one of the following: a) A by-product, residue, or waste stream from agriculture, forestry, and related industries; or b) Originating from dedicated plantations that comply with all relevant applicability conditions in the most recent version of CDM TOOL¹⁶.	Not applicable, since the ICSs involved in the project replace traditional biomass-fueled cookstoves with more efficient devices. The project does not involve the use of renewable biomass as a fuel source but rather focuses on reducing biomass consumption through improved efficiency.
VM0050	Where biomass residues are used, they would have been left to decay or burned without energy recovery before implementation of the project activity, and their use does not involve a decrease in carbon pools – in particular of dead wood, litter, or soil organic carbon – on the land areas from which the biomass residues originate.	Not applicable, since the ICSs involved in the project do not use biomass residues as a fuel source. Instead, the project focuses on improving the efficiency of biomass consumption in traditional cooking practices, thereby reducing overall fuel demand rather than introducing new biomass sources.
VM0050	Where biomass residues from a production process are used, project implementation does not result in an increase in the processing capacity of raw input or any other substantial changes (e.g., product change) in this process.	Not applicable, since the ICSs involved in the project do not use biomass residues as a fuel source. Instead, the project focuses on improving the efficiency of biomass consumption in traditional cooking practices, thereby reducing overall fuel demand rather than introducing new biomass sources.
VM0050	The project does not use multiple types of renewable biomass as a fuel source but instead improves the efficiency of existing biomass use, reducing overall fuel consumption.	The project does not use multiple types of renewable biomass as a fuel source but instead improves the efficiency of existing biomass use, reducing overall fuel consumption.
VM0050	Where project activities introduce renewable biomass as charcoal, it is renewable charcoal produced by efficient charcoal production processes ⁶ (e.g., retort sedentary) kilns, improved sedentary kilns, Casamance kilns). Methane produced	Not applicable, The project does not introduce renewable biomass as charcoal but instead focuses on improving the efficiency of biomass consumption in traditional cooking practices, reducing overall fuel demand.

	during the charcoaling process is captured and destroyed or combusted for energy purposes.	
VM0050	Project devices using renewable biomass (fuel-switch) or non-renewable biomass (improved efficiency) are single-pot, multi-pot portable, or in-situ cookstoves with an initial thermal efficiency of at least 25%	All ICSs involved in the project are portable cookstoves with an initial thermal efficiency of more than the minimum requirement of 25%. This ensures improved fuel efficiency and compliance with the applicability condition.
VM0050	Project devices using LPG or bioethanol are single-pot, multi-pot portable, or in-situ cookstoves with an initial thermal efficiency of at least 30%	Not applicable, the project does not involve the use of LPG or bioethanol cookstoves. It focuses on the distribution of improved biomass cookstoves.
VM0050	Electric project devices meet the maximum risk factor score of 15 on the Cookstove Durability Protocol and have the following minimum thermal efficiency: a) Hot plates and electric hobs: 40% b) Induction stoves and other electric stoves: 70%	Not applicable, the project does not involve electric cookstoves. It focuses on the distribution of improved biomass cookstoves.
VM0050	Project devices using LPG comply with all of the following conditions: a) The baseline fuel either includes non-renewable biomass or is a more carbon intensive fossil fuel (demonstrated by the baseline survey, see Section 6.2) b) The project has a provision for metering LPG supplied to each consumer at the LPG filling station, in order to determine household LPG consumption; and c) The project does not seek to issue any carbon credits for periods after 31 December 2045.	Not applicable, the project does not involve LPG cookstoves. It focuses on the distribution of improved biomass cookstoves.
VM0050	Electric project devices use the following electricity sources: a) Decentralized renewable energy systems: Decentralized energy systems using fossil fuels are not eligible, except for backup generators that supply less than 1% of the annual electricity of the decentralized renewable energy system. b) Self-generated renewable electricity (with a maximum of 20% electricity from non-renewable sources for backup); or	Not applicable, the project does not involve electric cookstoves. It focuses on the distribution of improved biomass cookstoves.

	c) National or regional electricity grid.	
VM0050	The project proponent designs incentive mechanisms to reduce the use of inefficient baseline devices and practices that can be replaced by the project devices and describes these mechanisms in the project description.	The project proponent has designed incentive mechanisms to eliminate the use of inefficient baseline cookstoves by distributing improved cookstoves (ICSs) free of cost to beneficiaries. Additionally, awareness programs and community engagement initiatives are in place to ensure sustained adoption. These mechanisms are detailed in the project description.
VM0050	Where a project device has ended its technical life, the project proponent either replaces it with a comparable or better project device or retrofits its essential components to continue meeting the minimum service level requirements (i.e., thermal energy generation), otherwise no further emission reductions may be claimed for the project device.	The project proponent ensures that once a project cookstove reaches the end of its technical life, it is either replaced with a comparable or better stove or retrofitted to maintain its functionality and efficiency. Otherwise, emission reductions from that cookstove will no longer be claimed.
VM0050	Project proponents implement a method for the distribution and identification of project devices that avoids double counting of emission reductions by other mitigation actions and includes unique product identification on the stove itself at the time of distribution/sale (e.g., program logo, alpha/numeric ID, and end-user location, such as geographic coordinates, complete address information).	The PP ensures that each distributed improved cookstove (ICS) is uniquely identified to avoid double counting of emission reductions. Each stove is marked with a program logo and assigned a unique identification number at the time of distribution. Additionally, a sales database will be maintained, recording end-user details, including geographic coordinates or address information, to ensure no double counting.
VM0050	The project complies with any national, sub-national, or local regulations or guidance for the installation, commercialization, distribution, and use of improved cookstoves and/or fuel supply and use for the target population. National, regional, and local regulatory frameworks for the provision of the type of thermal energy services provided by the project activity must be documented.	A review of the national energy policies of the Rwanda shows that there are no mandatory laws, policies or requirements mandating the use of ICS. Though the Government of Rwanda's (GoR) Energy Sector Strategic Plan (2018/19 - 2023/24) identifies dissemination of improved cookstoves (ICS) as one way to reduce fuel wood consumption. The government promotes the use of improved ICS, however it's not mandatory. Rwanda's Updated NDC (2020) ¹¹ submitted in May 2020, highlights the country's commitment to reducing biomass dependency by promoting improved cookstoves and other improved technology.

¹¹ https://unfccc.int/sites/default/files/NDC/2022-06/Rwanda_Updated_NDC_May_2020.pdf

		Rwanda's Energy Policy (2025)¹² Published in February 2025 promotes a transition from traditional biomass (firewood & charcoal) to modern, efficient cooking technologies like LPG, biogas, and improved cookstoves. The government aims to increase affordability through subsidies, financial partnerships, and market development. It also focuses on scaling up cooking gas infrastructure, setting new standards for clean cooking technologies. The project complies with applicable local laws and regulatory frameworks. Under Rwandan law and regulation, none of the activities or processes relating to the manufacture or distribution of Improved cookstoves require Environmental Impact Assessments not meet any of the screening criteria in Appendix 2, page 40 of the EIA guidelines¹³.
VM0050	Where project activities reduce emissions from non-renewable biomass, including firewood and charcoal, the risk of double counting is assessed on a national basis by evaluating at validation and crediting period renewal whether there are REDD+ projects or jurisdictional REDD+ programs whose project boundary overlaps with the expected fuel source area of the project. The project proponent must report on the findings of this assessment for informational purposes in the project description.	Rwanda currently hosts several forest conservation and REDD+ readiness projects. However, these initiatives are primarily focused on capacity building, restoration, and policy development, and are not registered under Verra's VCS carbon program for the issuance of verified carbon credits (VCUs). Also, a review of other registries viz Gold Standard and UNFCCC CDM also did not yield any REDD project in Rwanda. Additionally, the grouped project's fuel sourcing area does not overlap with any operational REDD+ projects or jurisdictional REDD+ programs generating carbon credits. Therefore, the risk of double counting is not applicable.

Methodology related clarification/ corrections (Dated 03 February 2025)

Clarification/ corrections	Applicability condition	Justification of compliance
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¹²

<https://www.mininfra.gov.rw/index.php?eID=dumpFile&t=f&f=118271&token=d00c119512f0e0c499d75c71a85026c8e12d11f5>

¹³ General Guidelines and Procedure for Environmental Impact Assessment, Republic of Rwanda, November 2006 (See filename: RW_EIA_Guidelines_Final_versionI_Nov_2006)

Clarification 1	As a cross-check, baseline fuel consumption results must be compared with data from reputable sources, including government publications, peer-reviewed literature, third-party studies, or official data and statistics. The sources must be relevant to the context of the project activity, reflecting baseline cookstove types, types of users, and cooking practices. Where used for cross-checks, these sources must reflect data collected no more than five years ago.	The PP have compared the baseline fuel consumption results with data from the “National Survey on Cooking Fuel Energy and Technologies in Households, Commercial and Public Institutions in Rwanda”, published by the Ministry of Infrastructure and Finance, Government of Rwanda. Relevant data can be found in Section 3.4 of this PD. This report was published in December 2020 and is therefore within the acceptable five-year window for cross-check data, as required by the clarification.
Clarification 2	For projects using direct measurement techniques (such as stove use monitors or electricity meters), usage rates are not capped. For projects employing surveys, the usage rate is capped at 90% where all of the following customer support actions are undertaken across the entire target population and demonstrated at verification: 1) Selection of technologies and fuels that fully meet the cooking needs of the target population, demonstrated by citing robust research or conducting an investigation of cooking practices and attitudes 2) Implementation of support activities to assist the target population in effectively operating and maintaining their cookstoves. These may include providing materials (print, in-person, or video) on how to operate the cookstove to prepare common local foods, how to troubleshoot common operational issues, and how to make minor repairs (including obtaining necessary replacement parts). All such communications and materials must be provided in local language(s) commonly used in the project area. 3) Provision of a commonly used, toll-free communications channel through which the target population can contact the project proponent to access support (e.g., maintenance and repair services)	The grouped project shall claim up to 90% usage rate (in case of surveys) provided the required customer support actions are substantiated in the monitoring report at the time of verification. Otherwise, in case of continuous monitoring the usage rate shall not be capped.

	For projects employing surveys and that do not implement all of these customer support actions across the entire target population, the usage rate is capped at 75%.	
Clarification 3	For usage rate monitoring, the project proponent must collect photographic evidence in the following manner: Take photographs of the stove(s), its components, and the cooking areas. The physical condition of the stove(s) and the cooking areas will help determine stove functionality and use.	The PP shall collect photographic evidence to support usage rate monitoring in accordance with the clarification. Photographs shall be taken of the stove(s), including all key components, as well as the associated cooking areas.
Clarification 4	The project stove efficiency ($\eta_{\text{new,avg,y}}$) must be determined using one of the following methods (options 1–3 prescribed in the methodology) and the corresponding documentation must be provided: 1) Water Boiling Test campaigns achieving 90/10 confidence and precision levels as per the most recent version of the CDM Standard for Sampling and Surveys for CDM Project Activities and Programmes of Activities 2) Manufacturer-certified value that is determined via the Water Boiling Test, with the test results made available for validation by a VVB 3) Certification from the host country's national standards body or certifying agency based on the Water Boiling Test For all three options, cookstove efficiency must be determined based on the Water Boiling Test following the most recent version of the Water Boiling Test Protocol¹ or equivalent national standard/protocol. While carrying out the tests, the low and high power (not simmer) efficiencies must be used to calculate the average thermal efficiency.	The Project Proponent shall determine the project stove efficiency ($\eta_{\text{new,avg,y}}$) using one of the three options available: 1) The Project Proponent shall conduct WBT campaigns that achieve 90/10 confidence and precision levels, as per the most recent version of the CDM Standard for Sampling and Surveys for CDM Project Activities and Programmes of Activities. 2) The Project Proponent may use manufacturer-certified efficiency values determined via the WBT. 3) The Project Proponent may submit certification issued by the host country's national standards body or another authorized certifying agency, based on the WBT.
Clarification 5	The following requirements must be applied in addition to the Controlled Cooking Test Protocol when conducting Controlled Cooking Tests (CCTs): 1) A minimum of 15 CCTs by five different cooks (three repeats per cook) must be conducted per cookstove model. 2) The CCTs must be alternated between the baseline and project cookstoves to limit potential bias	Not applicable

	caused by increased cook efficiency over repeats. For artisanal cookstoves, at least three randomly selected samples of each cookstove model must be tested.																					
Clarification 6	The following values of equivalent standard male adults must be applied when determining the parameters Hh_i and $Hh_{j,k}$ (instead of the references provided in Section 9.1 of VM0050, v1.0, parameter table for Hh_i and $Hh_{j,k}$): <table><tr><th>Gender and age</th><th>Fraction of standard adult</th></tr><tr><td>Child 0–14 years</td><td>0.5</td></tr><tr><td>Female over 14 years</td><td>0.8</td></tr><tr><td>Male 15–59 years</td><td>1.0</td></tr><tr><td>Male over 59 years</td><td>0.8</td></tr></table>	Gender and age	Fraction of standard adult	Child 0–14 years	0.5	Female over 14 years	0.8	Male 15–59 years	1.0	Male over 59 years	0.8	The PP have applied the following values of equivalent standard male adults when determining the parameters Hh_i and $Hh_{j,k}$. Refer Hh_i parameter of section 5.1 for more details. <table><tr><th>Gender and age</th><th>Fraction of standard adult</th></tr><tr><td>Child 0–14 years</td><td>0.5</td></tr><tr><td>Female over 14 years</td><td>0.8</td></tr><tr><td>Male 15–59 years</td><td>1.0</td></tr><tr><td>Male over 59 years</td><td>0.8</td></tr></table>	Gender and age	Fraction of standard adult	Child 0–14 years	0.5	Female over 14 years	0.8	Male 15–59 years	1.0	Male over 59 years	0.8
Gender and age	Fraction of standard adult																					
Child 0–14 years	0.5																					
Female over 14 years	0.8																					
Male 15–59 years	1.0																					
Male over 59 years	0.8																					
Gender and age	Fraction of standard adult																					
Child 0–14 years	0.5																					
Female over 14 years	0.8																					
Male 15–59 years	1.0																					
Male over 59 years	0.8																					
Clarification 7	For the wood-to-charcoal conversion factor (CF), in addition to government-approved/endorsed national or regional values, the following source of data is accepted for claiming values of up to six tonnes of dry wood input per tonne of charcoal output: Published, peer-reviewed literature specific to the project region and context	Not applicable																				
Clarification 8	Footnote 35 must be read as follows: ³⁵ The project proponent may rephrase the question keeping in mind the objective (i.e., whether or not the project cookstove is in ~~usable~~ good condition). Where the project cookstove is not in ~~usable~~ good condition, the project proponent must exclude such stoves from the project database for the whole crediting year and subsequent years. The project proponent may include such stoves again on replacing them with new cookstoves of similar efficiency.	The project proponent shall exclude cookstoves from the project database for the entire crediting year and subsequent years if survey results show that the stoves are not in good condition. These stoves will be removed from the calculations until they are replaced with new cookstoves that have similar efficiency characteristics. Once the replacement stoves are installed, they can be included again in the project database.																				
Correction 1	The third paragraph on page 14 should be read as follows: The initial baseline survey must be performed prior to validation. The project proponent may employ local third-party agencies to carry out the baseline survey. Follow-up baseline surveys must be conducted at most every ~~two~~ five years from the date of the last survey in control households that do not participate in the project. The project proponent may	PP shall conduct Follow-up baseline surveys at most every five years from the date of the last survey. The project proponent may conduct additional surveys at any time, including at crediting period renewal. Additionally, the project proponent may employ local third-party agencies to carry out the baseline survey.																				

	conduct additional surveys at any time, including at crediting period renewal.	
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Tool 30 - Calculation of the fraction of non-renewable biomass

Tool	Applicability condition	Justification of compliance
Tool 30	This tool may be used by: a) DNAs to submit region- or country-specific default f_{NRB} values, following the procedures for development, revision, clarification and update of standardized baselines (SB procedures); or b) project participants to calculate project- or PoA-specific f_{NRB} values.	Option (b) applied to calculate the project specific f_{NRB} value as described under in the separate f_{NRB} spreadsheet submitted to VVB.
Tool 30	Project participants and DNAs shall identify and clearly delineate the applicable area for which f_{NRB} is determined. For project- or PoA- specific f_{NRB} values, project participants shall assess and use the area from which woody biomass is sourced for end-users included in the project activity and justify the selection of the area in CDM project design documents. For region- or country-specific f_{NRB} values, DNAs shall specify the applicable area.	The PP has chosen host country Rwanda as region for the project activity.
Tool 30	Project participants and DNAs may choose between the following two options to determine the value of f_{NRB} : (a) Use the default value as provided in TOOL33; or (b) Calculate f_{NRB} by determining the share of renewable and non-renewable woody biomass in the total quantity of woody biomass consumption for the country/region or the project area (hereinafter referred as the applicable area) following the procedure and requirements in the paragraphs below. The project participants shall compare and analyse the calculated values against the values for f_{NRB} reported in relevant scientific literature and justify any differences. This analysis shall be included in the appropriate section of the PDD. The relevant scientific literature should include at least: (i) Bailis, R.; Drigo, R.; Ghilardi, A. & Masera, O. (2015). The carbon footprint of traditional woodfuels. Nature Climate Change, 5(3), pp. 266–272.	The PP has chosen option b), wherein a third- party consultant has established the f_{NRB} for host country. Please refer Appendix-2 for calculation details and comparison with literature.
Tool 30	If the f_{NRB} value is estimated at the national level, as a cross check, project proponent shall compare the value of estimated NRB with the product of: i) total average above ground biomass tonnage of the area of forest areas deforested in recent past (tonnes/ha), and ii) most recent available observed annual rate of deforestation (ha/yr). If the estimated NRB value is more than 10% above the value calculated as per the product of biomass and deforestation rate, justification shall be provided for the higher value for NRB	Please refer Appendix-2 for cross check.

3.3 Project Boundary

As per the applied methodology VM0050, the project boundary is the geographical location of all the solid biomass project devices and the locations from which baseline and project fuels are sourced. As the activity involves distribution of ICS (Improved Cookstove) and fuel sourcing from throughout Rwanda, the project boundary is the physical, geographical location Rwanda.

Source		Gas	Include d?	Justification/Explanation
Baseline	Thermal generation energy	CO ₂	Yes	Major Source
		CH ₄	Yes	Major Source
		N ₂ O	Yes	Major Source
	Production of charcoal fuel	CO ₂	Yes	Not applicable, the project does not involve charcoal. It focuses on the distribution of improved wood cookstoves.
		CH ₄	Yes	
		N ₂ O	Yes	
Project	Thermal generation energy	CO ₂	Yes	Major Source
		CH ₄	Yes	Major Source
		N ₂ O	Yes	Major Source
	Transport of fuel (where applicable)	CO ₂	No	In the baseline scenario, households rely on inefficient traditional cookstoves, leading to higher fuel consumption and more frequent trips for fuel collection or purchase. This results in greater emissions from transportation due to the increased demand for fuel distribution. In contrast, the project scenario introduces more efficient improved cookstoves (ICSs), which significantly reduce fuel consumption. With lower fuel demand, there are fewer trips needed for fuel transportation, leading to lower emissions from fuel production and transport. Since emissions are higher in the baseline than in the project scenario, they can be ignored as per section 5 of the methodology.
		CH ₄	No	
		N ₂ O	No	
	Production of fuel (where applicable)	CO ₂	Yes	Not applicable, the project does not involve charcoal. It focuses on the distribution of improved wood cookstoves.
		CH ₄	Yes	
		N ₂ O	Yes	
	Self-generated electricity (non renewable energy for backup)	CO ₂	No	Not applicable, the project does not involve electric cookstoves. It focuses on the distribution of improved biomass cookstoves.
		CH ₄	No	
		N ₂ O	No	
	Grid electricity generation and distribution	CO ₂	No	Not applicable, the project does not involve electric cookstoves. It focuses on the distribution of improved biomass cookstoves.
		CH ₄	No	
		N ₂ O	No	

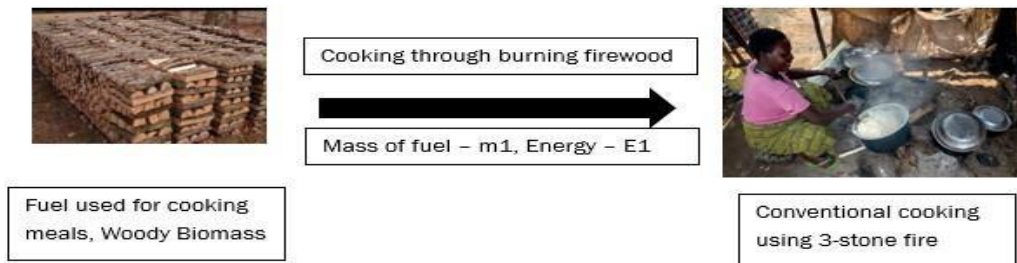


As per the template requirements, the diagram of the equipment distributed under the grouped project is provided in Section 1.

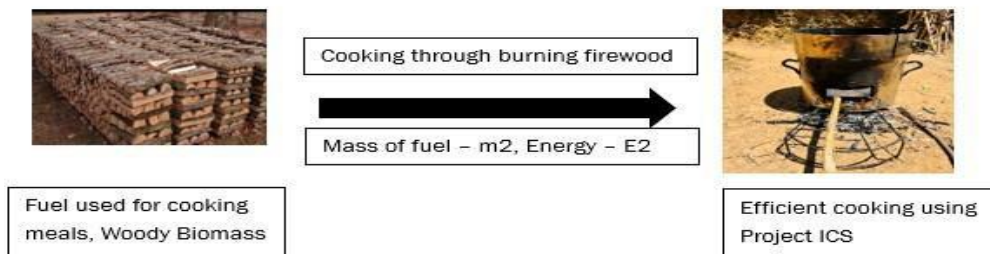
Flow of mass and energy within the grouped project activity is described below.

A representation of baseline and project boundary are given as below:

Baseline Scenario:



Project Scenario:



the change in mass of firewood between *baseline* and project scenario is $m_1 > m_2$.

Here,

The change in energy consumed for cooking between baseline and project scenario is E1<E2. The systems that were *applied* for the distribution activity to take place, are described in the Section 5 of this document.

3.4 Baseline Scenario

For this project activity, the baseline scenario represents the continued use of traditional wood-fuel cookstoves by rural households across Rwanda, where domestic users rely on inefficient cooking technologies due to limited access to improved alternatives. In the absence of the project, these households would persist in using solid biomass as their primary fuel source, leading to high fuel consumption, increased deforestation, and elevated greenhouse gas emissions. The inefficiencies of traditional stoves contribute to significant environmental and health impacts, reinforcing the need for intervention.

1) Selection and Justification of the Baseline Scenario

Step 1: Alternative baseline scenarios:

As per the Fifth Rwanda Population and Housing Census, 2022 thematic report on Characteristics of Households and Housing¹⁴, prepared by the Ministry of Finance and Economic Planning and the National Institute of Statistics of Rwanda, and released in July 2023, more than 93% of total households in Rwanda rely on solid biomass as a cooking fuel. Among rural households—who are the primary beneficiaries of the project—over 97% depend on biomass. Specifically, 93.3% of rural households rely entirely on firewood and 4% on the charcoal as their baseline fuel, while less than 1% of the rural population uses clean fuel for cooking.

Table 8.14: Distribution (count and %) of the private households by main source of energy for cooking by province and area of residence

Province and Main source of energy for cooking	Count			Percentage		
	Urban	Rural	Total	Urban	Rural	Total
Rwanda						
Firewood	329,422	2,190,867	2,520,289	34.2%	93.3%	76.1%
Charcoal	478,164	94,984	573,148	49.6%	4.0%	17.3%
Gas	129,507	21,265	150,772	13.4%	0.9%	4.6%
Electricity	803	190	993	0.1%	0.0%	0.0%
Kerosene/Parafine	155	87	242	0.0%	0.0%	0.0%
Biogas	138	149	287	0.0%	0.0%	0.0%
Solar Power	76	589	665	0.0%	0.0%	0.0%
Crop waste	2,884	14,272	17,156	0.3%	0.6%	0.5%
Animal dung	34	270	304	0.0%	0.0%	0.0%
Briquette	42	285	327	0.0%	0.0%	0.0%
Peat	10	27	37	0.0%	0.0%	0.0%
Sawdust	245	723	968	0.0%	0.0%	0.0%
Other cooking fuel	249	1,031	1,280	0.0%	0.0%	0.0%
Never cook	22,513	23,634	46,147	2.3%	1.0%	1.4%
Not Stated	45	83	128	0.0%	0.0%	0.0%
Total	964,287	2,348,456	3,312,743	100.0%	100.0%	100.0%

Source: Fifth Rwanda Population and Housing Census, 2022

Also, as per the latest available Demographic and Health Survey (DHS)¹⁵ 2019-20, published in September 2021 by the National Institute of Statistics of Rwanda (NISR) in collaboration with the Ministry of Health (MoH), 98.9% of the rural population relies on solid fuels for cooking, with 71% of rural household's dependent on firewood and 20.9% using straw, shrubs, or grass as their primary cooking fuel. The same report states that only 1% of the rural population in Rwanda use clean cooking fuels.

¹⁴ <https://statistics.gov.rw/file/14187/download?token=dCyOX3ty>

¹⁵ <https://dhsprogram.com/pubs/pdf/FR370/FR370.pdf>

Table 2.3 Household characteristics

Percent distribution of households and de jure population by housing characteristics, percentage using solid fuel for cooking, percentage using clean fuel for cooking, and percent distribution by frequency of smoking in the home, according to residence, Rwanda DHS 2019-20

Housing characteristic	Households			Population		
	Urban	Rural	Total	Urban	Rural	Total
Electricity						
Yes	86.4	36.7	45.7	86.4	38.4	46.6
No	13.6	63.3	54.3	13.6	61.6	53.4
Total	100.0	100.0	100.0	100.0	100.0	100.0
Flooring material						
Earth/sand	20.2	75.3	65.3	20.3	74.5	65.2
Dung	0.0	0.3	0.2	0.0	0.3	0.2
Bricks without cement	0.6	1.4	1.2	0.7	1.4	1.3
Parquet or polished wood	0.0	0.0	0.0	0.0	0.0	0.0
Vinyl or asphalt strips	0.0	0.0	0.0	0.0	0.0	0.0
Ceramic tiles/coastal brick	11.2	0.7	2.6	13.5	0.8	3.0
Cement	67.8	22.4	30.6	65.3	23.0	30.2
Carpet	0.0	0.0	0.0	0.0	0.0	0.0
Other	0.1	0.0	0.0	0.1	0.0	0.0
Total	100.0	100.0	100.0	100.0	100.0	100.0
Rooms used for sleeping						
One	29.4	17.2	19.4	17.2	11.1	12.1
Two	30.2	40.4	38.5	30.1	38.4	37.0
Three or more	40.3	42.5	42.1	52.7	50.5	50.9
Total	100.0	100.0	100.0	100.0	100.0	100.0
Place for cooking						
In the house	24.1	21.9	22.3	20.6	19.5	19.7
In a separate building	42.6	61.6	58.2	49.6	65.0	62.3
Outdoors	32.5	16.3	19.2	29.6	15.5	17.9
No food cooked in household	0.8	0.2	0.3	0.2	0.1	0.1
Other	0.0	0.0	0.0	0.0	0.0	0.0
Total	100.0	100.0	100.0	100.0	100.0	100.0
Cooking fuel						
Electricity	0.5	0.1	0.2	0.5	0.1	0.2
LPG/natural gas/biogas	18.2	1.1	4.2	15.8	0.9	3.4
Kerosene	0.1	0.0	0.0	0.0	0.0	0.0
Charcoal	53.9	7.8	16.2	53.8	6.9	14.9
Wood	22.9	70.0	61.4	25.8	71.0	63.3
Straw/shrubs/grass	3.6	20.5	17.4	3.7	20.9	17.9
Agricultural crop	0.0	0.1	0.1	0.0	0.1	0.1
Animal dung	0.0	0.0	0.0	0.0	0.0	0.0
Briquette	0.0	0.0	0.0	0.0	0.0	0.0
Sawdust	0.1	0.0	0.0	0.1	0.0	0.0
Other	0.0	0.0	0.0	0.0	0.0	0.0
No food cooked in household	0.8	0.2	0.3	0.2	0.1	0.1
Total	100.0	100.0	100.0	100.0	100.0	100.0
Percentage using solid fuel for cooking ¹	80.3	98.5	95.2	83.3	98.9	96.2
Percentage using clean fuel for cooking ²	18.7	1.3	4.5	16.3	1.0	3.6

Additionally, based on the beneficiary selection criteria set by the Project Proponent (PP), households using fuels other than biomass or those already equipped with improved cookstoves featuring chimneys, fuel gas ventilation systems, or grates are not eligible for the project activity. As part of the improved cookstove (ICS) distribution process, the PP verifies with beneficiaries that they are using traditional wood-fuel cookstoves. Only after this confirmation end users receive the ICS. The baseline stove can also be validated through the user agreement/ sales ledger/Poster. The poster is in local language Kinyarwanda, which makes it clearly understandable for the end user.

Thus, based on the above data, solid biomass emerges as the primary baseline scenario in Rwanda. Since the Project Proponent (PP) provides improved cookstoves (ICS) exclusively to households that were *previously* using wood-based baseline stoves, all selected beneficiaries meet the baseline requirement of relying on non-renewable wood fuel in traditional inefficient cookstoves.

The project intervention directly replaces traditional wood-based cooking practices with improved cookstoves, establishing the wood-based stove *baseline* scenario as the sole applicable baseline for the project activity. The only alternative scenario is the project activity without being registered under a GHG program.

The Project Proponent (PP) conducted a baseline survey and baseline KPTs between September to December 2021, to assess the type & quantity of fuels consumed and the cooking technologies in use in pre-project scenario. Given the above Surveys/KPTs were based on the older methodology, the PP has reconducted the baseline surveys (KPTs) in line with the applied methodology VM0050 ver 1.0 and the KPT protocol during January 2025 to assess the types of fuels and cooking technologies used in the pre-project scenario. The *baseline* survey results confirmed that solid biomass fuel and solid biomass-based cooking technologies—primarily traditional stoves and three-stone fires—are the most widely used among households.

Thus, the baseline scenario was identified as the continued *use* of traditional cookstoves without chimneys, grates, and/or three-stone fires for cooking. Further details on the baseline survey and Kitchen Performance Test (KPT) are provided in the following sections.

Based on the Government of Rwanda's reports and the baseline survey findings, it is confirmed that solid biomass is the primary baseline scenario. The only alternative scenario is the project activity without being registered under a GHG program¹⁶.

Step 2: Existing and forthcoming government policies and legal requirements

Since it has been confirmed that solid biomass is the primary baseline scenario and the only alternative scenario is the project activity without being registered under a GHG program, the requirement to eliminate baseline alternatives that are inconsistent with existing or forthcoming mandatory legal or regulatory requirements is not applicable.

There are no government-imposed restrictions or binding regulations as per the policies reviewed¹⁷ that prohibit the continued use of traditional biomass cookstoves in the project region. Additionally, there are no mandatory efficiency standards or air quality regulations that would systematically enforce a transition away from traditional biomass-based cooking. Therefore, the consideration of alternative baseline scenarios remains unchanged, and no further eliminations are required under this criterion.

Step 3: Financial, institutional, and information barriers

As explained above, the only alternative scenario is the project activity without being registered under a GHG program. However, this scenario is not viable due to significant financial barriers.

Since the Project Proponent (PP) distributes improved cookstoves (ICS) free of cost to end users, the project relies solely on revenue from the sale of Verified Carbon Units (VCUs) to sustain its operations. Without registration under a GHG program, the project would lack a financial mechanism to cover the costs of cookstove production, distribution, and monitoring. As a result, the alternative scenario of implementing the project without GHG registration is not financially feasible and cannot be considered a realistic baseline alternative. Therefore, no alternate baseline scenarios exist.

Thus, the remaining baseline scenario is the target population's continued use of inefficient cookstoves fired with non-renewable firewood to meet similar thermal energy outputs for cooking as the project devices. Therefore, the project activity remains consistent with the defined baseline scenario, ensuring compliance with the methodology.

2) Baseline Scenario Survey

¹⁶ As per applied methodology page 12: The project activity without being registered as a project activity under a GHG program must be included as an alternative.

¹⁷ Add 3-4 policies from 4151

PP conducted baseline survey and baseline KPTs in line with the applied methodology VM0050 ver 1.0 and the KPT protocol between 13 January 2025 to 17 January 2025, to assess the type & quantity of fuels consumed and the cooking technologies in use in pre-project scenario. The baseline survey was scheduled to ensure that no major festivals, holidays, or similar events were present, minimizing any potential impact on the outcomes. The PP initially conducted desk-research to identify regions (districts) where use of traditional cookstoves and wood fuel is predominant. This was followed by designing a survey questionnaire to validate the baseline scenario in the selected regions.

According to these surveys the baseline scenario was identified as the continued use of traditional cookstove (e.g. Rondereza) without chimney or grate or three-stone fired for preparation of meal and all 128 households (100%) were using a three-stone fire as their primary baseline stove.

The details of the sample size calculation for baseline surveys, sample selection criteria, procedures used for conducting KPT, and the results of KPT are as follows:

Sample Size: The sample size was determined using CDM Guideline: Sampling and Survey for CDM PA and PoA version 4.0 and appendix 5 of the applied methodology. The sample size for parameter $BC_{b,i,y}$ (mean parameter) was calculated as 55 (each province wise is given below).

The PP ensured that calculated sample size met all appropriate methodological thresholds and is representative of the entire target population. Therefore, PP then oversampled to account for potential non-responses, data quality concerns, and hardware errors. This process resulted in a total target sample size of 150.

Sample Selection Criteria:

Rwanda has a total of 5 provinces – Eastern, Western, Northern, Southern, and Kigali. However, the 5th province, i.e. Kigali, includes 100% urban/peri-urban households and therefore is not included in the sampling procedure as these households lay outside the scope of the project.

The targeted sample size of 150 was divided among the four provinces of Rwanda - Eastern, Northern, Southern, and Western - resulting in approximately 35 samples per province. PP covered 12 rural districts across these four provinces (3 district from each province) of Rwanda as shown in the table below. Enumerators were given adequate training in relation to data collection and quality checks by the PP.

FINAL SELECTION			
Eastern Province	Northern Province	Western Province	Southern Province
District	District	District	District
Kirehe	Musanze	Nyamasheke	Nyamagabe
Ngoma	Gicumbi	Rusizi	Ruhango
Bugesera	Burera	Ngororero	Muhanga

These districts were generated randomly. Once a target of 35-40 samples per province was confirmed by the technical team, the operational team, who has previously received KPT data collection training from Berkeley Air Monitoring Group (BAMG), was instructed to target 7-8 villages per province and 5 samples per village.

Out of the 150 target samples, PP successfully conducted 128 KPTs in line with the KPT protocol. The sample coverage is as follows:

Province	Min. Sample Size Required	Sample Covered
Eastern	17	33
Northern	10	33
Southern	14	33
Western	14	29
Total	55	128

PP also incorporated questionnaires on seasonality to capture variations in fuel consumption, in accordance with the KPT protocol.

Baseline Survey and KPT Results

- Baseline fuel type(s) and the percentage of their use by the target population:** According to the baseline survey conducted by PP, 124 out of 128 households reported using only wood fuel as their primary fuel, while 4 households indicated using both wood and charcoal as fuel. This means that approximately 4% of households use both wood and charcoal, while 96% rely exclusively on wood for cooking. These findings closely align with the Fifth Rwanda Population and Housing Census, 2022¹⁸ published by the Government of Rwanda, which reports that nearly 94% of the rural households depends on firewood as their primary cooking fuel and 4% on charcoal.
- Source(s) of each baseline fuel:** According to the baseline survey conducted by PP, 46 out of 128 households (~36%) reported purchasing fuel, while 82 out of 128 (~64%) stated that they collect fuel for cooking. These findings closely align with the 2020 National Survey on Cooking Fuel Energy and Technologies in Households, Commercial, and Public Institutions in Rwanda, which reports that nearly 69% of households purchase wood fuel.
- Baseline technologies for cooking and the percentage of their use by the target population:** According to the baseline survey conducted by PP, 124 out of 128 households reported using only three-stone fire, or a conventional cooking system as their primary baseline cooking technology, while 4 households indicated using both three-stone fire, or a conventional system and traditional charcoal stove as cooking technology. This means that approximately 4% of households use both, while 96% rely exclusively on three-stone fire, or a conventional cooking system for cooking.
- Average household size (Hhi):** According to the baseline survey conducted by PP, the average reported household size in rural baseline households is approximately 4.3.

As per the Baseline Kitchen Performance Test (KPT) conducted by the Project Participant (PP), the annual baseline fuel consumption per person was determined through a KPT survey of 128 households. The final calculated value was 2.57 kg per person per day.

¹⁸ <https://statistics.gov.rw/file/14187/download?token=dCyOX3ty>

Kg/person/day assessment	Baseline KPT
Number of Samples	128.00
Median	2.39
Quartile (Q1)	1.69
Quartile (Q3)	3.38
IQR	1.69
Upper Quartile limit	5.91
Lower Quartile limit	0.00
95-10 Precision Assessment	Baseline KPT
Average consumption (kg/person/day)	2.57
Standard Deviation	1.14
Coefficient Of variance (CV)	0.44
Lower Bound value of confidence interval	2.37
Upper Bound value of confidence interval	2.77
Confidence interval	0.40
Precision (2-sided)	0.08
95-10 Rule Met?	YES
Household Size (HHi)	4.31
Average consumption (tons/HH/year)	4.04

As per National Survey on Cooking Fuel Energy and Technologies in Households, Commercial and Public Institutions in Rwanda, a report by Ministry of Infrastructure and Finance (Govt. of Rwanda), the consumption of traditional biomass is around 6.75 tonnes/HH/year. Therefore, the applied baseline fuel consumption value of 4.04 tonnes per household per year by PP is 40% lower than the government literature's value, making it the most conservative.

3.5 Additionality

The additionality of the project is demonstrated as per the requirements outlined in Section 7 of the applied methodology:

3.5.1 Regulatory Surplus

Is the project located in an UNFCCC Annex 1 or Non-Annex 1 country?

☐ Annex 1 country ☒ Non-Annex 1 country

Are the project activities mandated by any law, statute, or other regulatory framework?

☐ Yes ☒ No

If the project is located inside a Non-Annex 1 country and the project activities are mandated by a law, statute, or other regulatory framework, are such laws, statutes, or regulatory frameworks systematically enforced?

☐ Yes ☐ No

If no, describe which mandated laws, statutes, or other regulatory frameworks require project activities and provide evidence of systematic non-enforcement to demonstrate regulatory surplus.

3.5.2 Additionality Methods

As per the section 7 of applied methodology:

Step 1: Regulatory surplus

The project is an entirely voluntary activity undertaken by the PP and is not mandated by any law, statute, or regulatory framework of host country.

Since the project operates in Rwanda, a UNFCCC non-Annex I country, and there are no systematically enforced laws or regulations requiring the distribution or adoption of improved cookstoves, the project qualifies as additional. The emission reductions achieved would not have occurred without the project's intervention.

Step 2: Positive list

The project meets the Positive List criteria as defined in the methodology, demonstrating automatic additionality:

- 1) It introduces efficient biomass-fired cookstoves that replace inefficient biomass-fired cookstoves, fulfilling Condition 1(a) of Section 7 of the methodology.
- 2) It distributes improved cookstoves at free of cost to end users, with no revenue source other than the sale of Verified Carbon Units (VCUs), satisfying Condition 2 of Section 7 of the methodology.

Since both conditions are met, the project qualifies under the Positive List and is deemed automatically additional under the methodology.

3.6 Methodology Deviations

Not applicable.

4 QUANTIFICATION OF ESTIMATED GHG EMISSION REDUCTIONS AND REMOVALS

4.1 Baseline Emissions

As per the section 8.1 of applied methodology, Baseline emissions are calculated as follows:

$$BE_y = \sum EC_{i,y} \times N_{j,k,y} \times n_{j,k,y} \times (EF_{b,i,CO_2} \times f_{NRB,y} + EF_{b,i,nonCO_2}) \quad (1)$$

Where:

BE_y	Baseline emissions during year y (t CO ₂ e)
$EC_{i,y}$	Average energy consumption of baseline device type i in year y (TJ)
$N_{j,k,y}$	Number of commissioned project devices of type j from batch k in year y
$n_{j,k,y}$	Proportion of commissioned project devices of type j from batch k that remain operating in year y (fraction)
EF_{b,i,CO_2}	CO ₂ emission factor for fuel used by baseline device type i in the baseline scenario (t CO ₂ /TJ)
$f_{NRB,y}$	Fraction of woody biomass that is established to be non-renewable used by baseline device in year y (fraction)
$EF_{b,i,nonCO_2}$	Non-CO ₂ emission factor for fuel used by baseline device type i in the baseline scenario (t CO ₂ e/TJ)
i	Baseline device type and its respective fuel type
j	Project device type and its respective fuel type

The average energy consumption of baseline device type i is calculated as follows:

$$EC_{i,y} = BC_{b,i,y} \times NCV_{b,i} \quad (2)$$

Where:

$BC_{b,i,y}$ Fuel used per baseline device type i during year y (tonnes)¹⁹
 $NCV_{b,i}$ Net calorific value of baseline fuel for baseline device type i (TJ/tonne)

Cross-check of $EC_{i,y}$ to address stove stacking

Compare the quantity of baseline energy consumption ($EC_{i,y}$) to energy used in the project scenario ($EC_{p,y}$) using back-calculation:

$$EC_{est,y} = EC_{p,y} \times \eta_{new,avg,y} / \eta_{old,avg} \quad (3)$$

Where:

$EC_{est,y}$ Back-calculated energy consumption of the potential mix of devices and fuels in the baseline in year y (TJ)
 $EC_{p,y}$ Energy used in project scenario by project devices during year y (TJ)
 $\eta_{new,avg,y}$ Weighted average efficiency of project devices in year y (fraction)
 $\eta_{old,avg}$ Weighted average efficiency of baseline devices that are replaced by project devices (fraction)

If baseline consumption ($EC_{i,y}$) exceeds back-calculated project consumption ($EC_{est,y}$), $EC_{est,y}$ will be used as a conservative cap in Equation (1) as follows:

$$BE_y = \sum \min \{EC_{i,y}, EC_{est,y}\} \times N_{j,k,y} \times n_{j,k,y} \times (EF_{b,i,CO2} \times f_{NRB,y} + EF_{b,i,nonCO2}) \quad (1a)$$

$$EC_{p,y} = \sum_{j,k} BC_{p,j,k,y} \times NCV_{p,j} \quad (4)$$

Where:

$BC_{p,j,k,y}$ Average quantity of fuel used by project device type j from batch k during year y (tonnes or m³)
 $NCV_{p,j}$ Net calorific value of project fuel used in project device type j (TJ/tonne or TJ/m³)

Section 8.1.1.1 (Equation 5) of the methodology is not applicable since the project does not involve electric cookstoves and focuses on the distribution of improved biomass cookstoves.

Sample Calculations of Estimated Baseline Emissions (BE_y) in a year (y):

Parameter	Applied value/Approach
$BC_{b,i,y}$	$= BC_{b,i,y} \text{ (tons/person/year)} \times H_{hi} \text{ (average HH size)}$ $= 0.9371 \times 4.31$ $= 4.04 \text{ tons/year}$
$NCV_{b,i}$	The values of $BC_{b,i,y}$ and H_{hi} are derived from the Baseline KPT/Survey. $= NCV_{p,j}$ $= 0.0156 \text{ TJ/tonne (Meth Default Value)}$
$EC_{i,y}$	$= BC_{b,i,y} \times NCV_{b,i}$ $= 4.04 \times 0.0156$ $= 0.063 \text{ TJ}$
$EC_{est,y}$	$= EC_{p,y} \times \eta_{new,avg,y} / \eta_{old,avg}$ $= 0.018 \times 0.4927 / 0.15$ $= 0.060 \text{ TJ}$ $\eta_{new,avg,y} = 0.4927 \text{ (assumed for ex-ante estimation only)}$ $\eta_{old,avg} = 0.15 \text{ (Meth Default Value)}$ Where $EC_{p,y}$ is calculated as follows:

¹⁹ This parameter corresponds to $BC_{ex-ante,b,i}$ for the first two years and where the follow-up baseline survey campaign shows that there are no significant changes in baseline fuel consumption. Otherwise, it corresponds to $BC_{b,i,y}$. However, In accordance with 'Correction and Clarifications to VM0050' dated 03 Feb 2025, it is entirely at the discretion of the project participant (PP) to determine whether to conduct any additional follow-up baseline surveys within the five years from the date of the last survey.

$$\begin{aligned}
 & EC_{p,y} \text{ (tons/year)} \\
 & = BC_{p,j,k,y} \text{ (tons/person/year)} \times Hh_{j,k} \times NCV_{p,j} \\
 & = 0.2739 \times 4.31 \times 0.0156 \\
 & = 0.018 \text{ TJ} \\
 & \text{The value of } BC_{p,j,k,y} \text{ is derived from the project KPT and } Hh_{j,k} \text{ (same as } Hh_i \text{) is} \\
 & \text{derived from the Baseline KPT in line with the applied methodology.} \\
 BE_y & = \min \{EC_{i,y}, EC_{est,y}\} \times N_{j,k,y} \times n_{j,k,y} \times (EF_{b,i,CO2} \times f_{NRB,y} + EF_{b,i,nonCO2}) \\
 & = \min \{0.060, 0.063\} \times 100,000 \times 0.9 \times (112 \times 0.6565 + 9.46) \\
 & = 448,135 \text{ tCO}_2\text{e} \\
 & \text{Where, } N_{j,k,y} = 100,000 \text{ (Assumed, for calculation purpose only and full year} \\
 & \text{operational)} \\
 & n_{j,k,y} = 0.9 \text{ (assumed for ex-ante estimation only)} \\
 & EF_{CO2} = 112 \text{ tCO}_2\text{e/TJ (Meth Default Value)} \\
 & EF_{non-CO2} = 9.46 \text{ tCO}_2\text{e/TJ (Meth Default Value)} \\
 & f_{NRB} = f_{NRB} \text{ (as per registered PD, refer appendix 2, tool 30 v 4.0)} \times (1- \\
 & \text{Adjustment factor of 26\%}) = 0.6565
 \end{aligned}$$

4.2 Project Emissions

As per the section 8.2 of applied methodology, Project emissions are calculated as follows:

$$PE_y = PE_{energy,y} + PE_{others,y} \quad (6)$$

Where:

PE _y	Project emissions during year y (t CO ₂ e)
PE _{energy,y}	Project emissions from energy consumption of project devices in year y (t CO ₂ e)
PE _{others,y}	Project emissions from other sources in year y (t CO ₂ e)

Project emissions from energy consumption of project devices using biomass in year y are calculated as follows:

$$\begin{aligned}
 & PE_{energy,y} \\
 & = \sum_j \sum_k BC_{p,j,k,y} \times N_{j,k,y} \times NCV_{p,j} \times n_{j,k,y} \times (EF_{p,j,CO2} \times f_{NRB,y} + EF_{p,j,non-CO2}) \quad (7)
 \end{aligned}$$

Where:

EF _{p,j,CO2}	CO ₂ emission factor for fuel used by project device type j in the project scenario (t CO ₂ /TJ)
EF _{p,j,nonCO2}	Non-CO ₂ emission factor for fuel used by project device type j (t CO ₂ e/TJ)

Section 8.2.2 (Equation 8) of the methodology is not applicable since the project does not involve electric cookstoves and focuses on the distribution of improved biomass cookstoves.

Section 8.2.3 (Equations 9 and 10) of the methodology does not apply as the project exclusively focuses on the distribution of improved biomass cookstoves and does not involve electric cookstoves, renewable biomass, biomass-derived fuels, or renewable charcoal.

Thus PE_{others,y} (Equation 9) will be considered zero in the calculation of project emissions.

Sample Calculations of Estimated Project Emissions (PE_y) in year y:

Parameter	Applied value/Approach
-----------	------------------------

$$\begin{aligned}
 PE_{energy,y} &= BC_{p,j,k,y} \text{ (tons/person/year)} \times Hh_{j,k} \times N_{j,k,y} \times NCV_{p,j} \times n_{j,k,y} \times (EF_{p,j,CO2} \times f_{NRB,y} + EF_{p,j,nonCO2}) \\
 &= 0.2739 \times 4.31 \times 100,000 \times 0.0156 \times 0.9 \times (112 \times 0.6565 + 9.46) \\
 &= 137,547 \text{ tCO}_2\text{e} \\
 &\text{The value of } BC_{p,j,k,y} \text{ is derived from the project KPT and } Hh_{j,k} \text{ (same as } Hh_i) \text{ is derived from the Baseline KPT in line with the applied methodology.} \\
 PE_{others,y} &= 0 \\
 PE_y &= PE_{energy,y} + PE_{others,y} \\
 &= 137,547 \text{ tCO}_2\text{e}
 \end{aligned}$$

4.3 Leakage Emissions

As per Section 8.3 of the methodology, an adjustment factor of 0.95 will be applied in Equation 11 to account for leakage emissions associated with the reduced or avoided use of non-renewable biomass.

4.4 Estimated GHG Emission Reductions and Carbon Dioxide Removals

As per section 8.4 of the methodology Net GHG emission reductions are calculated as follows:

$$ER_y = (BE_y - PE_y) \times 0.95 - LE_{RB,y} \quad (11)$$

Where:

ER_y Emission reductions during year y (t CO₂e)
 $LE_{RB,y}$ Leakage emissions associated with use of renewable biomass during year y (t CO₂e)

Sample Calculations of Estimated Net GHG Emission Reductions (ER_y) in Year (y):

$$\begin{aligned}
 ER_y &= (BE_y - PE_y) \times 0.95 - LE_{RB,y} \\
 &= (448,135 - 137,547) \times 0.95 - 0 \\
 &= 295,058 \text{ tCO}_2\text{e (Estimated Net GHG Emission Reductions for a year)}
 \end{aligned}$$

Vintage period	Estimated baseline emissions (tCO ₂ e)	Estimated project emissions (tCO ₂ e)	Estimated leakage emissions (tCO ₂ e)	Estimated reduction VCU's (tCO ₂ e)	Estimated removal VCU's (tCO ₂ e)	Estimated total VCUs (tCO ₂ e)
11 Oct 2021-31 Dec 2021	523	154	18	350	-	350
01 Jan 2022-31 Dec 2022	1,757,757	516,107	62,083	1,179,567	-	1,179,567
01 Jan 2023-31 Dec 2023	2,577,132	756,689	91,022	1,729,420	-	1,729,420
01 Jan 2024-31 Dec 2024	2,577,132	756,689	91,022	1,729,420	-	1,729,420
01 Jan 2025-31 Dec 2025	3,902,299	1,145,240	137,853	2,619,206	-	2,619,206

01 Jan 2026-31 Dec 2026	4,033,483	1,185,790	142,385	2,705,308	-	2,705,308
01 Jan 2027-31 Dec 2027	4,163,151	1,223,340	146,991	2,792,820	-	2,792,820
01 Jan 2028-10 Oct 2028	3,148,442	929,359	110,954	2,108,128	-	2,108,128
Total	22,159,919	6,513,368	782,328	14,864,219	-	14,864,219

For detailed calculation, please refer to the ex-ante ER calculator.

5 MONITORING

5.1 Data and Parameters Available at Validation

The following parameters are fixed for the entire crediting period using default values as per the methodology:

Data / Parameter	EF_{b,i,CO_2} EF_{p,j,CO_2}
Data unit	t CO ₂ /TJ
Description	CO ₂ emission factor for fuel used by baseline device type i in the baseline scenario CO ₂ emission factor for fuel used by project device type j in the project scenario
Equations	(1), (7), (10)
Source of data	Option 3: Default value from the most recent version of the IPCC Guidelines for National Greenhouse Gas Inventories
Value applied	Wood: 112 t CO ₂ /TJ
Justification of choice of data or description of measurement methods and procedures applied	IPCC default value for wood as per the applied methodology
Purpose of data	Calculation of baseline emissions and project emissions
Comments	—

Data / Parameter	$EF_{b,i,non-CO_2}$ $EF_{p,j,non-CO_2}$
Data unit	t CO ₂ e/TJ
Description	Non-CO ₂ emission factor for fuel used by baseline device type i in the baseline scenario Non-CO ₂ emission factor for fuel used by project device type j in the project scenario
Equations	(1), (7)
Source of data	Option 3: Default value from the most recent version of the IPCC Guidelines for National Greenhouse Gas Inventories
Value applied	Wood: 9.46 t CO ₂ e/TJ (AR5 GWP)
Justification of choice of data or description of measurement	IPCC default value for wood as per the applied methodology

methods and procedures applied	
Purpose of data	Calculation of baseline emissions and project emissions
Comments	

Data / Parameter	$NCV_{b,i}$ $NCV_{p,i}$
Data unit	TJ/tonne
Description	Net calorific value of baseline fuel used by baseline device type i Net calorific value of project fuel used by project device type j
Equations	(2), (4), (7), (10)
Source of data	Option 3: Default value from the most recent version of the IPCC Guidelines for National Greenhouse Gas Inventories
Value applied	Wood: 0.0156 TJ/tonne
Justification of choice of data or description of measurement methods and procedures applied	2006 IPCC Guidelines for National Greenhouse Gas Inventories as per the applied methodology
Purpose of data	Calculation of baseline emissions and project emissions
Comments	--

Data / Parameter	$BC_{ex-ante,b,i}$
Data unit	Tonnes/HH/Year
Description	Ex-ante annual average quantity of fuel used per baseline device type i
Equations	(2)
Source of data	Option 1: A measurement campaign has been conducted following the Kitchen Performance Test Protocol and data has been analyzed in compliance with the most recent version of the CDM Standard for Sampling and Surveys for CDM Project Activities and Programmes of Activities v 9.0. The campaign was conducted in the month of January 2025. The result has been scaled appropriately using the average household size to obtain the value of $BC_{ex-ante,b,i}$.
Value applied	4.04 The value can be traced from the 'Baseline_Result' tab of the spreadsheet titled "VCS 4150 ReQ Baseline + Project Assessment v1.0 02042025".
Justification of choice of data or description of measurement methods and procedures applied	Measurement campaign following the Kitchen Performance Test
Purpose of data	Calculation of baseline emissions
Comments	Energy consumption has been determined prior to validation.

Data / Parameter	$\eta_{old,avg}$
-------------------------	------------------

Data unit	Fraction
Description	Weighted average efficiency of baseline devices that are replaced by project devices
Equations	(3)
Source of data	VM0050 methodology default (Page 30)
Value applied	0.15
Justification of choice of data or description of measurement methods and procedures applied	For a three-stone fire using firewood or a cookstove without an improved combustion air supply or flue gas ventilation, a default value of 0.15(15%) is applied. The project distributes non-renewable wood-based improved cookstoves (ICS), replacing only baseline devices that meet these criteria.
Purpose of data	Calculation of baseline emissions
Comments	--

Data / Parameter	Hh _i Hh _{j,k}										
Data unit	Equivalent standard male adults										
Description	Average household size of the target population using device type i Average household size of the target population using device type j from batch k										
Equations	Input to EC _{i,y} , BC _{b,i,y} , and BC _{p,j,k,y}										
Source of data	Baseline survey										
Value applied	4.31 The value can be traced from the 'Baseline_Result' tab of the spreadsheet titled "VCS 4150 ReQ Baseline + Project Assessment v1.0 02042025".										
Justification of choice of data or description of measurement methods and procedures applied	A baseline survey campaign is conducted based on the CDM Standard for Sampling and Surveys for CDM Project Activities and Programmes of Activities v 9.0. The campaign was conducted in the month of January 2025.										
Purpose of data	Estimation of average energy consumption when applying Option 1: Measurement campaign (Section 8.1.1) of the applied methodology Cross-checking energy and fuel consumption values										
Comments	This parameter has been determined ex ante via the baseline survey as described in Section 6.2 of the applied methodology. In accordance with 'Correction and Clarifications to VM0050' dated 03 Feb 2025, The following values of equivalent standard male adults has been applied when determining the parameters Hh _i and Hh _{j,k} (instead of the references provided in Section 9.1 of VM0050, v1.0, parameter table for Hh _i and Hh _{j,k}). <table border="1"> <thead> <tr> <th>Gender and age</th><th>Fraction of standard adult</th></tr> </thead> <tbody> <tr> <td>Child 0–14 years</td><td>0.5</td></tr> <tr> <td>Female over 14 years</td><td>0.8</td></tr> <tr> <td>Male 15–59 years</td><td>1.0</td></tr> <tr> <td>Male over 59 years</td><td>0.8</td></tr> </tbody> </table>	Gender and age	Fraction of standard adult	Child 0–14 years	0.5	Female over 14 years	0.8	Male 15–59 years	1.0	Male over 59 years	0.8
Gender and age	Fraction of standard adult										
Child 0–14 years	0.5										
Female over 14 years	0.8										
Male 15–59 years	1.0										
Male over 59 years	0.8										

5.2 Data and Parameters Monitored

Data / Parameter	N _{j,k,y}
Data unit	Number

Description	Number of commissioned project devices of type j from batch k in year y																		
Equations	(1, (7), (8)																		
Source of data	Monitoring (ICS distribution database)																		
Description of measurement methods and procedures to be applied	The following data will be recorded during project activity implementation: 1. Number of new devices distributed under the project activity, identified by the type of device and date of commissioning; and 2. Identification information of the recipient of the device distributed under the project activity (e.g., name, address, phone number). Data management and reporting of this information shall adhere to both data privacy requirements and good practice.																		
Frequency of monitoring/recording	Every time that new project devices are distributed																		
Value applied	<table border="1"> <thead> <tr> <th>Year</th><th># ICS</th></tr> </thead> <tbody> <tr><td>2021</td><td>499</td></tr> <tr><td>2022</td><td>373,491</td></tr> <tr><td>2023</td><td>548,326</td></tr> <tr><td>2024</td><td>548,326</td></tr> <tr><td>2025</td><td>848,326</td></tr> <tr><td>2026</td><td>898,326</td></tr> <tr><td>2027</td><td>948,326</td></tr> <tr><td>2028</td><td>948,326</td></tr> </tbody> </table> (for ex-ante estimation only, ex-post values to be sourced from ICS distribution database)	Year	# ICS	2021	499	2022	373,491	2023	548,326	2024	548,326	2025	848,326	2026	898,326	2027	948,326	2028	948,326
Year	# ICS																		
2021	499																		
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2024	548,326																		
2025	848,326																		
2026	898,326																		
2027	948,326																		
2028	948,326																		
Monitoring equipment	N/A																		
QA/QC procedures to be applied	N/A																		
Purpose of data	Calculation of baseline and project emissions																		
Calculation method	N/A																		
Comments	The number of project devices will be recorded in a sales database to ensure transparency.																		

Data / Parameter	$\eta_{j,k,y}$
Data unit	Fraction
Description	Proportion of commissioned project devices of type j from batch k that are still being used regularly in year y
Equations	(1, (7), (8)
Source of data	Monitoring (Project Usage Surveys)
Description of measurement methods and procedures to be applied	Option 1 (SUMs): Measured directly using stove use monitors (SUMs) in a sample of users according to the most recent version of the CDM Standard for Sampling and Surveys for Project Activities and Programmes of Activities and achieving 90/10 confidence precision for the proportion of devices in operation. The SUMs must confirm that the stove is frequently used and functional. Option 2 (surveys): Based on an adoption rate determined by a survey according to the most recent version of the CDM Standard for Sampling and Surveys for Project Activities and Programmes of Activities and achieving 90/10 confidence precision for the proportion of devices in operation. The lower

	end of the 90% confidence interval will be used to ensure conservativeness. The adoption survey will include: - Kitchen observation (which includes visual and physical checks of the stove and its components), including photographic evidence; and - Interview with the primary cook. The project proponent will provide proof of training and supervision to ensure field teams have the capacity required to complete adoption surveys successfully. The average of the sum of "yes" (1) responses to the adoption survey question "If yes, have you used the stove regularly since you installed it?" (where this response is cross-checked and confirmed with the physical check of the stove and the coherency with the responses to the following questions of the survey), and "no" (0) responses to the questions "do you use the project cookstove?" and "If yes, have you used the stove regularly since you installed it?". where the project does not achieve the target precision in a monitoring period, the project proponent will apply an appropriate conservativeness deduction as per Section 4 of the most recent version of the CDM Standard for Sampling and Surveys for CDM Project Activities and Programmes of Activities.
Frequency of monitoring/recording	Option 1: (SUMs): continuous
Value applied	Option 2 (surveys): annually
Monitoring equipment	0.90
QA/QC procedures to be applied	Not Applicable.
Purpose of data	The date on which a sample project device stopped being used should be taken as follows:
Calculation method	Option 2 (surveys): Where the project device is not working or not being used at the time of conducting the survey, it should be conservatively assumed that the project device has not been active since the date on which the last adoption survey was conducted.
Comments	Calculation of baseline and project emissions
	N/A.
Data / Parameter	$f_{NRB,y}$
Data unit	Fraction or %
Description	Fraction of woody biomass that is established to be non-renewable used by device in year y
Equations	(1, (7)
Source of data	Option 2: Calculated based on CDM TOOL30 and applying an uncertainty discount of 26%.
Description of measurement methods and procedures to be applied	Calculated as per the "TOOL30: Calculation of the fraction of non-renewable biomass" and applying an uncertainty discount of 26% in accordance with applied methodology
Frequency of monitoring/recording	Ex-ante for each crediting period
Value applied	0.8872
	0.6565 (After accounting for 26% Uncertainty factor)
Monitoring equipment	N/A

QA/QC procedures to be applied	N/A
Purpose of data	Calculation of baseline and project emissions
Calculation method	The value of 0.8872, registered in the Project Design Document (PD) under TOOL30 Version 4 for Rwanda, is adjusted to account for uncertainty in accordance with VM0050. A 26% uncertainty discount is applied, resulting in the following adjusted value: $0.8872 \times (1 - 0.26) = 0.6565$
Comments	This data has been fixed for entire crediting period. The applied f_{NRB} value has been calculated by using the latest available data sources. As per the f_{NRB} calculation done by PP, the value is 91% however as a measure of conservativeness, PP used the f_{NRB} value from another registered projects which was lesser than 91%. Hence, the value has changed to 88.72% and finally to 0.6565 with uncertainty discount consideration.
Data / Parameter	$BC_{b,i,y}$
Data unit	Tonnes/HH/Year
Description	Fuel used per baseline device type i during year y
Equations	(2)
Source of data	Option 1: A measurement campaign following the Kitchen Performance Test Protocol in control households that do not participate in the project, established prior to validation as statistically equivalent to the pre-project conditions of project households regarding baseline fuel consumption
Description of measurement methods and procedures to be applied	Option 1: Follow-up baseline surveys will be conducted every five years ²⁰ in control households that do not participate in the project, established prior to validation as statistically equivalent to the pre project conditions of project households regarding baseline fuel consumption. Measurement campaign shall be updated where follow-up baseline surveys show that the fuels, fuel sources, or technologies used by the control group are no longer statistically equivalent to the pre-project conditions of project households. The measurement campaign will be designed, carried out, and analyzed in compliance with the most recent version of the a) CDM Standard for Sampling and Surveys for CDM Project Activities and Programmes of Activities and b) KPT protocols by Clean Cooking Alliance. The result will be scaled appropriately using the average household (hh_i) size to obtain the value of $BC_{b,i,y}$.
Frequency of monitoring/recording	Every five years
Value applied	4.04
Monitoring equipment	N/A
QA/QC procedures to be applied	The campaign must achieve a confidence and precision of at least 90/10 for the target parameter of average daily fuel consumption per adult equivalent. Where the project does not achieve the target precision in a monitoring period, the project

²⁰ In accordance with 'Correction and Clarifications to VM0050' dated 03 Feb 2025, it is entirely at the discretion of the project participant (PP) to determine whether to conduct any additional follow-up baseline surveys within the five years from the date of the last survey.

	proponent must apply an appropriate conservativeness deduction as per Section 4 of the most recent version of the CDM Standard for Sampling and Surveys for CDM Project Activities and Programmes of Activities
Purpose of data	Calculation of baseline emissions
Calculation method	N/A
Comments	All the households assessed by the PP during the baseline surveys / KPT (128 households) have been designated as the control group for follow-up surveys. The sample was drawn in accordance with the CDM Sampling & Survey guidance as per the approach described in Section 3.4 of the PD above; ensuring random and un-biased sample subject selection. Additionally, the fact that the baseline survey results correspond to Fifth Rwanda Population and Housing Census, 2022, confirms the control group to statistically represent the pre-project baseline conditions of the target population, as per requirements on page 14 of VM0050 v1.0. The baseline assessment subject households are deemed fit to be considered as control group given these were non-participant households (having not received project ICS at the time of survey/KPT). The baseline survey / KPT data for these 128 control households already includes all the requisite details as per the binding questionnaire of VM0050 v1.0. The database has necessary information to provide for unique identification of household, such as the household head/main cook's name and address / location and contact details etc. for their traceability five years later and subsequent baseline reassessment. These records are submitted to VERRA secretariat and will be made available to future verifiers, as needed. To reduce the risk of control households receiving project stoves, the PP shall keep these households excluded from project distribution campaigns. If however, certain control households naturally / independently adopt an improved stove (from this project or other offset / non-offset program) or otherwise, that will get captured in the following baseline re-assessment campaign. The adoption of improved stoves by control households shall result in establishing a conservative baseline during re-assessment and hence is deemed a non-risk factor. Also, after five years (or earlier), at the time of re-assessment of baseline, with the subjects of controlled group, if any of the 128 households are not traceable (or have relocated), new control subjects (households) may be added to the control group or otherwise, the baseline re-assessment shall be carried out only on the available / traceable control subjects that consent to being re-assessed.
Data / Parameter	$\eta_{new,avg,y}$
Data unit	Fraction
Description	Weighted average efficiency of project devices in year y
Equations	(3)
Source of data	Monitoring (Manufacturer certified / Standard WBT campaigns)

Description of measurement methods and procedures to be applied	The efficiency shall be established using one of the following methods, and the corresponding documentation shall be presented: 1) Water Boiling Test campaigns achieving 90/10 confidence and precision levels as per the most recent version of the CDM Standard for Sampling and Surveys for CDM Project Activities and Programmes of Activities 2) Manufacturer-certified value that is determined via Water Boiling Test; or 3) Certification from the host country's national standards body or certifying agency. A Standard Water Boiling Test campaigns (option a) will be used to account the decrease in thermal efficiency of project device j from batch k due to aging during a given monitoring period.
Frequency of monitoring/recording	Annually
Value applied	Kuniokoa Generation 2 Rated Thermal efficiency (with pot skirt) – 0.5130 Rated Thermal efficiency (without pot skirt) – 0.4340 Ecoa wood Generation 3 Rated Thermal efficiency (with pot skirt) – 0.5200 Rated Thermal efficiency (without pot skirt) – 0.4550 SSM S32-X Rated Thermal efficiency with Pot Skirt – 0.501 Rated Thermal efficiency without Pot Skirt – 0.457 (for ex-ante estimation only) (For more details refer previously registered 4150 PD MR dated 03-December-2023)
Monitoring equipment	-
QA/QC procedures to be applied	N/A
Purpose of data	Calculation of baseline and project emissions
Calculation method	N/A
Comments	Different models of ICS may be used at the time of distribution (hence monitoring), as indicated in Section 1.12 of PD. In case of inclusion of other/new models, during the project lifetime, corresponding thermal efficiency values shall be used for Ex-post ER calculations. Further, ex-post monitoring shall assess (on sampling basis) the continuity of usage of pot skirts by monitoring the usage of pot skirts and the thermal efficiency will be calculated as the weighted average of the efficiency of skirted stoves and non-skirted stoves.
Data / Parameter	BC _{p,j,k,y}
Data unit	Tonnes/HH/Year

Description	Average quantity of fuel used by project device type j from batch k during year y
Equations	(4), (7)
Source of data	Monitoring (Project KPT campaign)
Description of measurement methods and procedures to be applied	Option 1: Kitchen Performance Test (KPT) A measurement campaign following the Kitchen Performance Test protocol shall be designed, carried out, and analyzed in compliance with the most recent version of the CDM Standard for Sampling and Surveys for CDM Project Activities and Programmes of Activities. The campaign must achieve confidence and precision of at least 90/10 for the target parameter of average daily fuel consumption per adult equivalent. The result must be scaled appropriately using the average household size to obtain the value of BC_{p,j,k,y}. Project activities applying KPTs shall also measure the quantity of fuel used by pre-project devices that are still operational and provide it in the calculation sheet and monitoring reports (this is a reporting-only requirement). Option 2: Direct measurement Apply continuous direct measurement using equipment calibrated in accordance with national/international requirements. A sample of project devices may be measured in such a way that confidence and precision of 90/10 is achieved for the target parameter of total annual fuel use. The sampling must comply with the most recent version of the CDM Standard for Sampling and Surveys for CDM Project Activities and Programmes of Activities.
Frequency of monitoring/recording	Biennial or annual for Option 1 Continuous and aggregated annually for Options 2
Value applied	1.19
Monitoring equipment	N/A
QA/QC procedures to be applied	Where SUMs are used to measure project stove adoption, the stove usage indicated by the measurements for this parameter must be consistent with the frequency of use indicated by SUM measurements.
Purpose of data	Calculation of baseline and project emissions
Calculation method	N/A
Comments	N/A

5.3 Monitoring Plan

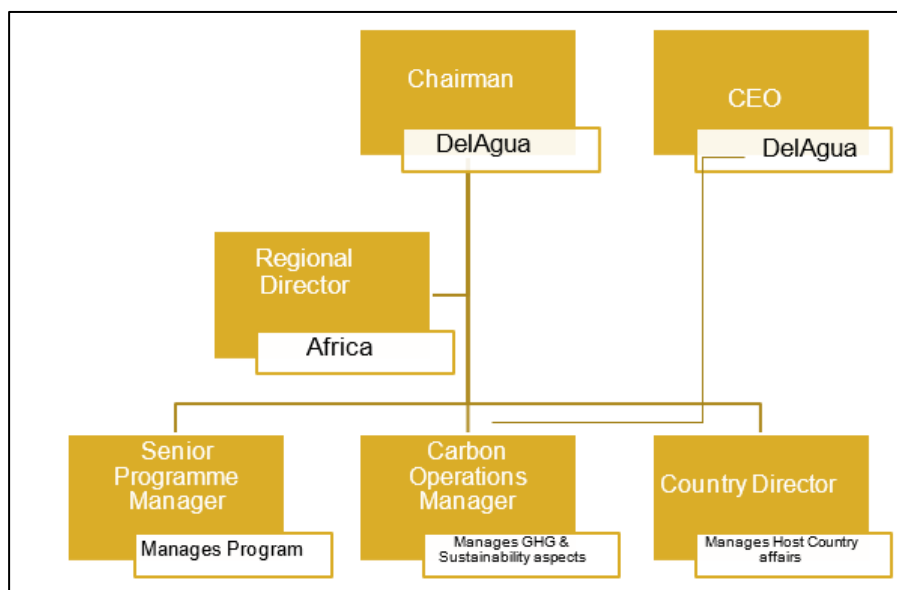
The VCS Grouped Project in Rwanda follows VCS standard requirements applicable, along with the methodological requirements on monitoring a grouped non-AFOLU large project activity. The Monitoring Plan is elaborated in multiple sub-sections for the sake of clarity.

PP shall maintain detailed records of the commissioning dates for all project devices, categorized by type (j) and batch (k), in accordance with the applied methodology. Throughout the crediting period, PP systematically monitors and records all relevant parameters as outlined in Section 9.2 of the methodology. Additionally, PP ensures full compliance with the requirements specified in the General Guidelines for SSC CDM.

The following monitoring plan is designed in accordance with the applied methodology VM0050 v1.0:

Team Involved: The DelAgua team involved in the GHG operations management is the local staff based in Rwanda along with the senior management.

The key responsibilities are shared by the team as follows:



Roles and Responsibility:

Chairman – Supervises the overall programme at strategy and financial side.

CEO – Acts as central point of strategy, programme management, finance, and technical domains of the programme.

Regional Director – Responsible for the regional level programme implementation and expansion planning and implementation.

Senior Programme Manager – Manages the programme at implementation level, and acts as an internal technical reviewer for the programme documents and procedures.

Carbon Operations Manager – Manages the operations for GHG emission mitigation programme, from planning to implementation stage. Additionally manages the Sustainability aspects of the programme.

Country Director – Supports programme in the operations and management at the host country level, and acting as point of communication between DelAgua and government of Rwanda.

The collective responsibilities of DelAgua as the Project Participant are indicated below :

- Acts as the project managing entity
- Development of PD

- Registration of the project with VERRA
- Inclusion of new PAIs upon satisfaction of the eligibility criteria stipulated in the PDD
- Authorized entity for any official communication with the VERRA and VVB
- Manage and archive the database for all appliances
- QA/QC of database during distribution & data collection
- Maintain local repair/replacement facilities
- Education and public awareness raising during initial distribution as well as periodic education campaigns.
- Data collection during distribution & delivery of data to database
- QA/QC of data collection
- Conduct ongoing monitoring, as required to ascertain monitored parameters.

The monitoring plan for this project is closely derived from the methodologies. A database for the project activity will be maintained by the DelAgua.

The methods for measuring, recording, storing, aggregating, collating and reporting on monitored data and parameters:

The monitoring plan shall consist of checking a representative sample of all ICS units distributed at least once every two years to ensure that they are still operating or are replaced by an equivalent in-service unit. A project database will be populated during the distribution of each initial cookstove issued, and will be updated based on subsequent replacements, as well as detailed data on the representative sample surveyed for monitoring purposes. The database will be accessible to the project proponent, appropriate partners, and the verification VVB. The database will include, at minimum, the following:

- Unique project identification number
- Installation date
- Family name
- Contact details of user (when available)
- Socioeconomic level (if households or communities are targeted), or type of establishment (if SMEs are targeted)
- Baseline cooking fuel source
- Baseline stove type
- Date of replacement of cook stove
- Monitored parameters
- Usage of Skirt with the project ICS

The database will be available to select a random, representative sample for monitoring and verification purposes. This sample set will be integrated into the database to include additional monitoring parameters as required or as appropriate. Monitoring surveys will include examination of the cookstove installations and verification that they are in an operational condition. Units that have been damaged or aged beyond expected operational condition will be replaced. Therefore, should some appliances not be replaced appropriately, this will be accounted for and appropriately deducted from emission reduction claims.

The procedures for internal auditing and QA/QC:

Spot checks of the database are conducted during the baseline surveys, distribution, and monitoring activities. Distributors are trained in the proper installation, use, and maintenance of the devices, and are provided with training sufficient to introduce recipient households to the proper operation and maintenance of the devices, as well as contact information for DelAgua. Supervisors receive similar training, as well as supervisory training in monitoring of distributor's activities. Supervisors are responsible for approximately 10 distributors. During the campaign, DelAgua staff will spot-check distributor quality, by revisiting 2 households per distributor, to verify that the stoves are in place, and that the recipient can show proper

operation of the units. The results of this spot check are recorded electronically and compared against the initial distribution logs. The data collected in the database is verified and controlled in the following way:

- i. Surveys are conducted by staff trained by DelAgua.
- ii. Supervisors are separately trained by DelAgua to spot-check surveyor results.
- iii. All ex-ante and monitored data parameters are collected on smart-phone based surveys and are uniform across all surveyors for any given survey activity.
- iv. Unknown to the surveyors, the database analysis includes verification of “valid” surveys including by a.) verifying household consent is received and b.) that the survey duration, as recorded by Internet time, is no shorter or longer than a reasonable value. For example, the baseline surveys for Rwanda were validated against a minimum of 20 minutes and a maximum of 120 minutes.
- v. Data validation is conducted on the database to ensure that values are numerically consistent, i.e. multiple choice values add up to 100% of respondents.

The procedures for handling non-conformances with the validated monitoring plan

The project proponent ensure that field personnel have reviewed, understood and have agreed to follow the monitoring plan procedures, including provisions for maximizing response rates, documenting out-of-population cases, refusals and other sources of non-response. To reduce interviewer bias, good questionnaire design and well-tested questionnaires are developed.

DelAgua is responsible for training any contractors used during distribution, education and monitoring activities. DelAgua ensures training of all on-site staff with respect to adherence to the Monitoring Plan of the project activity. Records of the training will be kept. Internal audit of all the records of the distribution, monitoring and education activities are performed on an annual basis, and will be carried out once (or twice, based on the requirements and plans) a year. Training records are saved for such training programs, where step-by-step training is provided to the surveyors for a quality data collection process, where they are expected to not impact the materially, degree of conservativeness, and perform the surveys in an unbiased manner. The surveyors are trained on a periodic basis, and refresher trainings are also provided to improve the quality of surveys from time to time. During these audits all the data and parameters that need to be monitored as per the monitoring plan will be checked and shortcomings if any will be reported and addresses. Since the surveys are electronic in format, recording of responses and the record keeping procedure for these surveys are conveyed to the team through rigorous trainings.

Deviations or errors in data collection are logged and reviewed, with supervisors conducting spot checks to ensure compliance. Corrective actions, such as re-training or additional surveys, are taken if non-conformances are found.

By integrating rigorous training, continuous oversight, and corrective measures, the project ensures that all monitoring activities align with the validated Monitoring Plan, maintaining data accuracy, credibility, and compliance.

Calculation of emission reductions:

Emission reductions will be calculated using the results of the most recent survey data. The updated parameters adjust all emission reduction results for the year monitored.

Sampling Plan:

PP follows the sampling approach outlined below, which is in line with the most recent version (v9.0) of the CDM Standard for Sampling and Surveys for CDM Project Activities and Programmes of Activities:

Due to the large number of ICS envisioned to be distributed as part of the project activity, it is not economically feasible to monitor each individual ICS unit distributed. Therefore, representative sampling will be undertaken as part of a cross-PA sampling Plan in line with the requirements of the methodology applied and the Standard: Sampling and surveys for CDM project activities and programmes of activities, version 9.0.

Sample sizes will be sufficient to ensure that the precision of the sample means/proportions are in accordance with the methodological / standard requirements. In cases where survey results indicate that desired precision is not achieved, the lower bound value of the corresponding confidence interval of the parameter value may be used as an alternative to repeating the survey. Alternatively, the survey may be expanded to reach the required confidence/precision.

The sampling methodology will be in accordance with the representative sampling methods provided by the sampling guidelines and standards as indicated along this section, with the applied methodology having precedence

Monitoring Objectives - The sampling objective for each parameter is to determine, via sampling survey, a statistically significant parameter value for the emission reduction calculations. These parameters are as listed in section 5.2:

No	Monitoring Parameters	Sampling Parameters	Parameter type	Monitoring frequency
1	$\eta_{j,k,y}$	Proportion of commissioned project devices of type j from batch k that remain operating in year y	Proportion	Annually
2	$\eta_{new,avg,y}$	Weighted average efficiency of project devices in year y	Mean	Annually
3	$BC_{b,i,y}$	Fuel used per baseline device type i during year y	Mean	Every five years
4	$BC_{p,j,k,y}$	Average quantity of fuel used by project device type j from batch k during year y	Mean	Biennial /annual

Target Population and sampling frame - The target population is the total population served under the grouped project, and the sampling frame consists of aggregated data of end-users of the ICS as recorded in the GP Databases. The sampling frame will be kept for 2 years following the crediting period or the last issuance of the VCU of the project activity.

Sample Method - Sampling will be conducted using stratified random sampling techniques²¹ over the sampling frame, and detailed calculations are provided below as per CDM guidelines “Sampling and surveys for CDM project activities and programmes of activities” the ICS in the sampling frame shall be stratified as per parameters requirements.

Stratified Random Sampling will be used to select samples from the Project Database for monitoring parameters.

Optionally, other sampling approaches may be used in accordance with Standard “Sampling and surveys for CDM project activities and programmes of activities” and Guideline for Sampling and Surveys for CDM Project Activities and Programme of Activities when sampling techniques or statistical analysis necessitates it.

²¹ Other Sampling approaches may be applied during the course of crediting period, in case needed.

To ensure a random selection of ICS, random number generators was applied. Each ICS in the target population is uniquely identifiable by its unique ID number. Each ICS can thus be allocated a Sample Selection Number in each monitoring period, starting at 1 and increasing up to the total number of ICS in the Database for that pre-defined sampling frame.

Applying the random number generators, the ICS was then be randomly chosen from the defined population up to the required sample size as calculated by the project proponent.

The sample size shall be determined using the following formula:

$$n \geq \frac{z^2 * N * V}{(N-1) * precision^2 + z^2 * V}$$

Where,

n = number of ICS to be sampled

N = Total number of ICS in the population

Z = Constant referring to level of confidence (1.96 for 95 %, 1.646 for 90%)

Precision = Required precision (e.g., 10% = 0.1)

Where for proportion-based parameters:

$$V = \frac{SD^2}{p^2}$$

$$SD^2 = \frac{\sum_{i=1}^k g_i * p_i * (1 - p_i)}{N}$$

$$p = \frac{\sum_{i=1}^k g_i * p_i}{N}$$

Where,

SD² = Weighted Overall Standard deviation

g_i = weight of strata i in the population

p_i = expected proportion of strata i in the population

k = total number of strata in the population

And for mean-based parameters:

$$V = \frac{SD^2}{mean^2}$$

$$SD^2 = \frac{\sum g_i \times SD_i^2}{N}$$

$$mean = \frac{\sum g_i \times m_i}{N}$$

Where,

Mean = weighted overall mean

m_i = Mean of strata i

In the case of parameters monitored for the first time the expected variation for that measure in the sample may be based on results from similar studies, pilot studies, or from the project planner's own knowledge / experience of the data. The data will be collected using surveys carried out either by external third parties or by project implementer teams. Data collected from the surveys will be compiled into an Excel spreadsheet.

Data obtained from the samples will be used to estimate proportions and mean values for the parameters described above. The values will then be factored into the emissions reduction calculations.

During sampling, there may be non-response from the target population. Over-sampling may be used to avoid non-response; however, sampling may be ceased once required confidence/precision is met.

The PP may not do cross-PAI sampling and rather conduct separate sampling and monitoring for each PA. In such a case, the approach defined above shall be applied to each PAI, albeit with 90/10 confidence / precision levels for annual sampling and 95/10 for biennial sampling (instead of 95/10 for annual/biennial sampling for cross-PAI sampling).

Similarly, for fuel measurement campaigns, sample sizes may be alternatively determined as per the available KPT protocols.

APPENDIX 1: COMMERCIALLY SENSITIVE INFORMATION

No information presented in the document is deemed commercially sensitive.

APPENDIX 2: FNRB CALCULATION

The f_{NRB} report using CDM Tool 30 version 4.0 was prepared by a third part expert C4 EcoSolutions (Pty) Ltd. They have 16+ years of experience of working on climate change, biodiversity, ecosystem restoration and scientific research/publications. They have been working in 105 countries across Africa, Asia, Europe, Asia Pacific, Latin America and the Caribbean. They have a diverse group of people working which includes scientist, hydrologist, botanist, climate change experts, forestry experts etc. Details of the work and experience can be found on <https://c4es.co.za/>.

Step 1: Estimation of renewable biomass (RB) in the country of Rwanda as per equation (4) of the f_{NRB} tool

$$RB = \sum (MAI_{forest,i} \times (F_{forest,i} - P_{forest,i})) + \sum (MAI_{other,i} \times (F_{other,i} - P_{other,i}))$$

Equation (4)

Where:

- $MAI_{forest,i}$ = Mean Annual Increment of woody biomass growth per hectare in sub-category i of forest areas in the relevant period (tonnes/ha/yr)
- $MAI_{other,i}$ = Mean Annual Increment of woody biomass growth per hectare in sub-category i of other land areas in the relevant period (tonnes/ha/yr)
- $F_{forest,i}$ = Extent of forest in sub-category i in the relevant period (ha)
- $F_{other,i}$ = Extent of other land in sub-category i in the relevant period (ha)
- $P_{forest,i}$ = Extent of non-accessible area (e.g. protected area where extraction of wood is prohibited, geographically remote area) within forest areas (in sub-category i) in the relevant period (ha)
- $P_{other,i}$ = Extent of non-accessible area (e.g. protected area where extraction of wood is prohibited, geographically remote area) within other land areas (in sub-category i) in the relevant period (ha)
- i = Sub-category i of forest areas and other land areas³

Parameters used:

Input parameter	Value	Data source
Extent of forest and	467,239	Geospatial data products for Rwanda were analysed to estimate Rwanda's renewable biomass. The forest and other wooded land cover for 2000 and 2021 was estimated using Hansen/UMD/Google/USGS/NASA ²² spatial data for 2000 and 2021, which is derived from Hansen et al. ²³ , and disaggregated according to the FAO ²⁴ global ecological zones. The total woody cover extent, including forests and other wooded areas, was calculated for each ecological zone, within the protected areas and within areas that are either accessible or geographically remote.
Protected areas within forest areas (in ha)	137,289	
Remote areas within forest areas (in ha)	12,681	

²² Hansen/UMD/Google/USGS/NASA. Hansen Global Forest Change v1.9 (2000-2021)

Available at: <https://glad.earthengine.app/view/global-forest-change>. Accessed on: 31 May 2023.

²³ Hansen, M. C. C. et al. High-resolution global maps of 21st-century forest cover change. Science (80-). 342, 850–854 (2013)

²⁴ FAO. 2012. Global ecological zones for FAO forest reporting: 2010 Update. Forest Resources Working Paper 179. Food and Agriculture Organisation of the United Nations, Rome. Available at: <https://www.fao.org/3/ap861e/ap861e00.pdf>.

Extend of non-accessible area (in ha), $P_{forest,i}$	149,970	Calculated (protected forest + remote forest)
Mean Annual Increment (t/ha/year), $MAI_{forest,i}$	1.82	The mean annual increment for forest is calculated as default age weighted average of the forest type and as per IPCC ²⁵ values for Tropical Mountain system.

Geographically remote areas were determined to be areas beyond a harvestable distance from roads and settlements. Conservatively, it was assumed that forests and wooded areas adjacent to all roads within a distance of 2.5 km are harvestable, despite how geographically remote or inaccessible these roads may be. This threshold was determined based on the peer-reviewed literature on wood harvesting practices.

Banks et al.¹⁸ found that woody biomass density increases significantly as a function of distance from the edge of a settled area. Beyond 450 m, average biomass density was found to increase from 2.1 to 16.6 t/ha. Jumble and Angelsen²⁶ modelled fuelwood choice from household survey data. They found that the most significant determinants of fuelwood choice are source attributes (size and species composition) and distance to source. The mean harvesting distance for their study was found to be 0.95 km. Bandyopadhyay et al.²⁷ matched household survey and remote sensing data to investigate wood fuel use in relation to poverty levels. They concluded that the one-way walk duration to wood fuel source for both poor and non-poor households is 0.6 hours. Assuming an average walking speed of 4 km/hr over uneven terrain, the average one-way distance to wood fuel source is less than 2.5 km. Areas beyond the harvestable distance were, therefore, determined to be geographically remote. Accessible areas are those that are not protected and not geographically remote, from which the annual renewable biomass production is calculated.

The default age-weighted mean annual increment (MAI) estimates of each ecological zone, as reported by the IPCC, were used for this study. The proportion of forest stand ages above and below 20 years old, including primary forests, were estimated for each ecological zone by extrapolating the observed forest gain extents between 2000 and 2012 to a 21-year period. The average MAI estimates for Rwanda is 1.82 t/ha/year for tropical mountain system between 2000 and 2012 to a 20 years period.

FAO Global Ecological Zone	Total forest cover (ha)	Protected area cover (ha)	Remote area cover (ha)	MAI (t/ha/yr)	Annual growth (t/yr), R
Tropical mountain system	467,239	137,289	12,681	1.82	578,495
Total	467,239	137,289	12,681	-	578,495

Total renewable biomass RB = 578,495 t/year

Step 2: Estimation of consumption of woody biomass (H) in the country of Rwanda as per equation (2) of the f_{NRB} tool

²⁵ IPCC. Forest Land. 2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 4: Agriculture, Forestry and Other Land Use 4, 1–29 (2019)

²⁶ Jumble, C. B. L. & Angelsen, A. Modeling choice of fuelwood source among rural households in Malawi: A multinomial probit analysis.

²⁷ Bandyopadhyay, S., Shyamsundar, P. & Baccini, A. Forests, biomass use and poverty in Malawi. Ecol. Econ. 70, 2461–2471 (2011)

NRB = H - RB

Where,

H = Total consumption of woody biomass in the applicable area in the relevant period (tonnes)

H = HW x N + CE + NE

Where,

HW = Average consumption of wood fuel per household, including fuelwood and charcoal, in the applicable area in the relevant period (tonnes/household)

N= Number of households consuming wood fuel within the applicable area in the relevant period (number)

CE= Commercial woody biomass consumption for energy applications (e.g. commercial, industrial or institutional uses of woody biomass in ovens, boilers etc.) that are extracted from forests or other land areas in the applicable area in the relevant period (tonnes)

NE= Commercial woody biomass consumption for non-energy applications (e.g. construction, furniture) that are extracted from forests or other land areas in the applicable area in the relevant period (tonnes)

The total woody biomass consumption combines the country's domestic and non-domestic energy and non-domestic non-energy consumption. Rwanda's estimate of total woody biomass consumption estimation is derived from World Bank population statistics²⁸ and consumption data sourced from literature^{29,30} the FAO³¹ and KPT surveys. Reported values of charcoal consumption are converted to the equivalent woody biomass using guidelines on kiln efficiency from the FAO forestry paper on industrial charcoal making³² and the latest CDM Tool 30 v04.0 2022 default charcoal-to-wood biomass conversion factor. The CDM default value of 4 was applied to the urban domestic charcoal consumption and non-domestic energy charcoal consumption.

Data was drawn from the most recently available official reports/statistics, in this case from the UN's Statistics Division to demonstrate both the recent trend in increase of wood fuel use at the household level, plus also the most recently available data (from 2021). This increase in fuelwood use at the household level has had a significant impact on the parameter value f_{NRB} . The density of fuel is not a time bound parameter, hence average of Africa is used as per published data by FAO.

Input parameter	Value	Data source
Wood fuel consumption (m3/capita/yr)	0.396	FAO ³³
Population of the country	13,276,517	World Bank ³⁴
Wood fuel consumption (m³/yr)	5,257,220	Calculated
Conversion factor (t/m3)	0.725	FAO ³⁵
HW (Average consumption of wood fuel tonnes/yr)	3,811,384	Calculated

Input parameter	Value	Data source
H (in t/year)	6,177,233	Calculated
HW	3,811,484	Calculated

28 <https://data.worldbank.org/>.

29 United Nations & African Union. Review of woodfuel biomass production and utilization in Africa

30 FAO. Forestry Sector in 2020: <https://www.fao.org/faostat/en/#data/FO>

31 FAO Statistics. Forest Products 2019. <https://www.fao.org/3/cb3795m/cb3795m.pdf> (2021)

32 Charcoal transition: <https://www.fao.org/3/i6935e/i6935e.pdf>

33 <https://www.fao.org/faostat/en/#data/FO>

34 <https://data.worldbank.org/>

35 <http://www.fao.org/3/a-i6935e.pdf>

woody biomass consumption in households (in t/year)		
CE Non domestic woody biomass consumption for energy application (in t/year)	201,877	Calculated, using wood to charcoal conversion factor ³⁶
NE Non domestic woody biomass consumption for non-energy application (in t/year)	2,163,872	Calculated using biomass expansion factor 1.50
Population of the country	13,276,517	World Bank ³⁷

Equation (3) of the f_{NRB} tool stipulates that the average household wood fuel consumption is multiplied with the number of households and industries consuming wood fuel for energy and non-energy applications within the country. Since most of the available and reliable data is total wood fuel consumption in households and commercial and other use.

The total population of host country has been sourced as per the published World Bank population data from 2022. This is in line with the f_{NRB} tool.

Step 3: Estimation of quantity of non-renewable biomass (t/year) as per equation (2) of the f_{NRB} tool

$$NRB = H - RB$$

Where,

H = Total consumption of woody biomass in the applicable area in the relevant period (tonnes)
This step calculates the quantity of non-renewable biomass (t/year) (NRB) by subtracting the renewable biomass estimated in step 1 from the total consumption of woody biomass estimated in step 2. No further input parameters are needed under this step.

$$NRB = 6,177,233 - 578,495$$

$$NRB = 5,598,738 \text{ t/year}$$

Step 4: Estimation of fraction of woody biomass that can be established as non-renewable (f_{NRB}) as per equation (1) of the f_{NRB} tool

$$f_{NRB} = \frac{NRB}{NRB + RB} \quad \text{Equation (1)}$$

This step calculates the fraction of woody biomass that can be established as non-renewable (f_{NRB}). The non-renewable biomass calculated in step 3 is divided by the sum of non-renewable biomass and renewable biomass calculated in step 1. No further input parameters are needed under this step.

$$f_{NRB} = 5,598,738 / (5,598,738 + 578,495)$$

$$f_{NRB} = 91.0\%$$

Step 5: Comparison as per para 6 of CDM Tool 30 version 4

As per the Bailis report, the f_{NRB} value for Rwanda is 59%. Rwanda is considered as wood fuel “hotspot” as most of the harvested wood fuel is unsustainable. The resulting f_{NRB} value is higher than the expected f_{NRB} values determined in the Bailis report³⁸ using the WISDOM method. While direct comparisons between the WISDOM and CDM methodologies are only sometimes appropriate—given the different approaches of the methodologies—the following factors can contribute to variations in the f_{NRB} estimates between the application of the CDM method in the present study and the WISDOM method in the Bailis report³⁹:

36 <https://cdm.unfccc.int/methodologies/PAMethodologies/tools/am-tool-33-v2.0.pdf>

37 <https://data.worldbank.org/>

38 Bailis R, Drigo R, Ghilardi A and Masera O. 2015. The carbon footprint of traditional woodfuels. Nat Clim Chang 5: 266–272

39 *ibid*

- **Parameter H (Total consumption of woody biomass in the applicable area in the relevant period (tonnes)):** The current report uses the most recent population statistics (2021) for Rwanda that represents an increase in population numbers since the 2009 data utilised in the Bailis report. Hence, the value of parameter H is higher than the one used Bailis report as it is calculated using the total population. - Updated 2019 FAO forest products statistics were used in the present study, whereas the comparison study used 2013 FAO forest products statistics.
- **Parameter RB (renewable biomass):** The approach used to determine the amount of forest that is accessible yields lower estimates in the present study than the comparison study. This results in a lower estimated RB and consequently increased NRB and f_{NRB} .
- **Parameter MAI (Mean Annual Increment):** In the present study, MAIs were calculated using a weighted average based on the forest area of three categories (i.e., primary forests, above 20-year secondary forest, below 20- year secondary forest). Data from the 2019 Refinement of the IPCC Guidelines was used in combination with extrapolating the observed forest gain extents between 2000 and 2012 to a future 21-year period. As per the Bailis report, MAI values were derived from a combination of field observations and IPCC values, followed by a different estimation of growth rates as a percentage of standing stock. This approach often yields higher MAIs and may lead to higher estimations of RB and subsequently, lower estimations of NRB and f_{NRB} .

The calculated f_{NRB} value of 0.91 indicates that the consumption of woody biomass from the accessible forest in Rwanda is greater than the country's capacity to renew the supply sustainably. This finding is supported by the consistent and widely-reported deforestation rate and dynamics observed for the country^{40,41,42}

The f_{NRB} value of the project was also compared against other registered projects across VERRA and Gold Standard in Rwanda. The f_{NRB} value used by recently registered projects are as follows:

Registry	Project ID	f_{NRB}
Verra	2380	97%
Gold Standard	4261	98%
Gold Standard	2450	98%
Gold Standard	11205	90%
Gold Standard	2449	98%
Gold Standard	11098	96.82%
Gold Standard	12308	88.72%

The f_{NRB} value used in other registered projects across various standards range from 88.72% to 98%. As a measure of conservative, the f_{NRB} value for the project has been changed to 88.72% which the lowest among the all the registered projects.

Step 6: Cross check in line with para 13 of CDM Tool 30 version 4.0

In line with para 13 of TOOL 30 V4, the NRB was compared to the top-down product of average above- ground biomass (146.06 t/ha) and the most recent annual deforestation data (3,187 ha/yr). NRB, as calculated in this report according to the CDM Tool 30 v4.0 2022, was found to be 5,598,738 t/yr, which is greater than the cross-check results based on deforestation (465,493 t/yr). It is expected that the cross-check estimate of biomass loss from deforestation could underestimate the extent of non- renewable biomass as it only considers the average biomass stocks from completely deforested areas. Unsustainable wood harvesting resulting in forest

⁴⁰ FAO. 2020b. Global Forest Resources Assessment 2020: Main Report. Food and Agriculture Organisation of the United Nations, Ro me. Available at: <https://www.fao.org/forest-resources-assessment/2020/en/>

⁴¹ Global Forest Watch (GFW). 2023.

⁴² Mongabay. 2020.

degradation and substantial reductions in biomass stocks, but not complete deforestation is not considered in the cross-check. Consequently, the estimate of NRB is considered applicable for this study given that the guidance provided by CDM Tool 30 v4.0 2022 was followed.

As per the requirements specified on page 34 of the applied methodology VM0050 v1.0, the Project Description (PD) shall discount the f_{NRB} value by 26% to account for uncertainty. Accordingly, the applicable f_{NRB} is calculated as follows:

$$0.8872 \times (1 - 0.26) = 0.6565$$