



**Verified Carbon
Standard**

DELAGUA CLEAN COOKING GROUPED PROJECT



Document Prepared by DelAgua

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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 (herein after also referred to as "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".

This program seeks to improve public health in the Republic of Rwanda. The program will distribute high efficiency ICS to the end-users, thus addressing their several critical public health challenges. Currently, many households in Rwanda cook their meals using unimproved cooking technologies/practices utilizing biomass (firewood & charcoal). In rural areas, firewood remains the most common type of cooking fuel, used by 93% of the households¹. In total, 79.9% of people in Rwanda are using firewood as their main cooking fuel.² About only 2% of the population has access to modern cooking fuels and technologies, concentrated in urban areas and high-income households, while about 15% have access to clean cooking stoves. Three-stone and traditionally manufactured stoves are predominant in rural areas, and 76% of Rwandan households spend more than 7 hours per week acquiring and preparing fuel, posing a high burden on women and girls, who are generally in-charge of these activities³. Cooking and childcare consume a large proportion of time for females in households; women and girls spend 15 hours a week on these two tasks alone; the time spent on cooking varies depending on the type of cooking stove used. On the other hand, fetching wood takes much longer in rural areas. Reducing gender inequalities, moving towards greater equity, and building a viable sustainable development path in which women could access an active and participatory role, are all challenges that this program aims to overcome.⁴

¹ <https://www.statistics.gov.rw/publication/eicv-5-main-indicators-report-201617>

² <https://www.statistics.gov.rw/publication/eicv-5-main-indicators-report-201617>

³ <https://mecs.org.uk/wp-content/uploads/2021/10/Policy-and-market-review-for-modern-energy-cooking-in-Rwanda.pdf>

⁴ <http://www.reg.rw/what-we-do/biomass/>

Charcoal is substantially more expensive than firewood, which is often collected for free. Charcoal monthly expenditure per household is around USD 10-15, while the monthly expenditure on firewood is USD 2 on average across the country (REG, 2021c).⁵

Another common issue with the public health in Rwanda is the respiratory diseases caused by indoor air pollution spread by the traditional cooking practices such as 3 stone fires and stoves without any grate or chimneys (commonly known as “*Rondereza*”). Indoor house air pollution accounts for over 7,800 premature deaths every year in Rwanda⁶.

This grouped project activity is aiming to reduce the biomass usage among households for cooking purposes.

The project technologies, ICS will be directly distributed to end-users via either of two methods: 1 - at centralized distribution points, where end-users from surrounding villages will be educated on the proper use and maintenance of the technologies. 2 - at retail locations, where individuals will be informed and trained (on the project technology usage, benefits, maintenance, and grievance mechanism) directly by retailers.

DelAgua will assign a district manager to oversee each district after the products are distributed, to respond to user feedback and address maintenance concerns. The PP will also maintain a call-center so that households can notify DelAgua when technologies need to be repaired or replaced. Households, local officials, and Community Health Workers (CHWs) will be provided with the call center number at the initial distribution. When maintenance concerns arise, DelAgua will repair the technology if possible, and will replace the technology if not. Technologies that cannot be repaired will be recycled or disposed of safely, such that they will not be burned or contribute to local pollution.

Ongoing education/monitoring will continue to respond to user feedback and address maintenance concerns. To the extent possible, distribution and ongoing monitoring will be conducted in collaboration with appropriate government agencies.

Recipients will voluntarily participate in the GP and the relevant Project Activity Instance PAI⁷), and confirm this via agreeing to an End User Agreement, which also confirms that any emissions reductions generated under the GP/PAI are owned by DelAgua. Certain data (Distribution Data) will be collected from ICS recipients which allows DelAgua to uniquely identify each ICS. This information will form a part of the project distribution database and will be populated during the distribution of each 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 Validation and Verification Body (VVB). The database will include at minimum the following:

⁵ <https://meccs.org.uk/wp-content/uploads/2021/10/Policy-and-market-review-for-modern-energy-cooking-in-Rwanda.pdf>

⁶ <https://meccs.org.uk/wp-content/uploads/2021/10/Policy-and-market-review-for-modern-energy-cooking-in-Rwanda.pdf>

⁷ A project activity instance within the Grouped Project under VCS is similar to the CPA within the PoA under CDM.

- Unique project identification number
- Installation date
- Family name
- Contact details of user (where available)
- Socio-economic level (according to the Rwandan Ubedehe approach).
- Baseline cooking fuel source
- Baseline stove type
- Date of any stove replacements
- Monitored parameters

The baseline scenario is the continuation of current practice, and is described in detail in the relevant section, separate for both the project technologies. The baseline systems that will be displaced by the project technologies are provided below:

- i) for ICS – three stone fire, and conventional stoves without improved combustion air supply for flue gas ventilation system are used as baseline cooking devices.
- ii) In both the project and baseline systems, biomass is combusted to deliver thermal energy for cooking, generating CO₂ in the process. The energy and mass flows, and the type and level of service, are the same in the baseline and project scenario. However, the project system is more efficient and therefore requires less biomass to deliver the same level of service and reduces CO₂ emissions from combustion.

Summary description of the technologies and measures to be implemented by the project.

The ICS design has a stainless-steel insulated combustion chamber, a small insulated sub-chimney and air inlets, which allows constant air inflow and improves combustion efficiency. Thermal transfer from the stove to the cooking pot is increased and GHG emissions are reduced. This highly effective stove uses less biomass fuel and emits less smoke. The convection-fueled air duct allows the further burning of smoke and dangerous particulate matter in the combustion process. The stoves distributed in this project have a specified high-power thermal efficiency of more than 25%, as specified in the manufacturer's specifications. The reduced wood-fuel demand from ICS use will also reduce habitat loss and decrease the pressure on the biodiversity in the region.

The location of the project:

Under the GP, DeAgua 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 1.12 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 - VMR0006 “Methodology for Installation of High Efficiency Firewood Cookstoves”, version 1.1 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.

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

The scenario existing prior to the implementation of the project activity would be usage of 3-stone fire and traditional stoves, which have a very low thermal efficiency, 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 563,081 and 3,941,567 tCO₂e, respectively, over the second 7-year renewable crediting period.

The second monitoring period for the project activity is 15-September-2021 to 28-February- 2023. The actual emission reduction achieved during current monitoring period is 1,149,391 tCO₂e.

Audit Type	Period	Program	VVB Name	Number of years
Validation	--	CDM	Carbon Check	
Joint Validation & Verification	01-January-2019 to 14-September-2021	VCS	Earthood Services Private Limited	2.70 years (988 days)
Joint Validation & Verification	15-September-2021 – 28-February-2023	VCS	Carbon Check (India) Private Limited	1.46 years (532 days)

Total	2	2	2	4.16 years
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1.2 Sectoral Scope and Project Type

Sectoral Scope 03 – Energy demand

Type II – Energy efficiency improvement projects

Activity category – non AFOLU

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”.

1.3 Project Eligibility

The Grouped Project Activity falls within the scope of the VCS Program. Also, none of the activities within the GP are listed in the category of excluded projects in Table 1 of the VCS Standard ver. 4.4, and therefore, it is eligible under the scope of the VCS Program.

Table 1: VCS Program scope

Scope	Applicability
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.
Ozone-depleting substances (ODS).	The GP does not involve any ODS.
Project activities supported by a methodology approved under the VCS Program through the methodology approval process.	The ICS to be distributed in the GP applies the methodology “VMR0006 “Methodology for Installation of High Efficiency Firewood Cookstoves”, version 1.1.” which is a VCS approved methodology.
Project activities supported by a methodology approved under a VCS approved GHG program, unless explicitly excluded under the terms of Verra approval.	Not applicable.

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. 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 hydro-power plants/units.
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, CO2 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 CO2e 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. Large-scale means energy-efficient improvements with a maximum savings greater than 60 GWh/year or emission reduction greater than 60 kt CO2e per year.	N/A. The GP activities do not include the installation and/or replacement of electricity transmission lines and/or energy efficient transformers.

Activities that reduce hydrofluorocarbon-23 (HFC-23) emissions	N/A. The GP reduces GHG emissions associated with the combustion of cooking fuels.
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1.4 Project Design

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

Eligibility Criteria

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

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.	Please refer the subsections below.	Please refer the subsections below.
1a	Project activities shall be implemented in domestic premises or in community-based kitchens.	Each PAI will distribute technology that is appropriate for domestic use to household end-users	a) Manufacturer's specifications. Project ICS distribution database containing unique household end user information.
1b	The project stove shall have specified high-power thermal efficiency of at least 25% per the manufacturer's specifications and shall exclusively use woody biomass and can be single pot or	ICS distributed in each PAI will have a thermal efficiency of at least 25%, and will be confirmed by the end user that they were using the firewood as the cooking fuel in the project's baseline. Each PAI will record the baseline and project fuel use to ensure that	1. Manufacturer's specifications. 2. Information recorded within the baseline KPT and project monitoring surveys on the fuel usage.

	multi-pot; in case of project stove replacing fossil fuel baseline stove, it shall exclusively use renewable biomass.	wood fuel is the sole source of energy.	
1c	Both 'Projects' and 'Large Projects' can use the methodology	PAIs will comply with the GP requirements	The GP is defined as a "Large Project" according to the guidelines set out in the VMR0006 methodology and can therefore apply the methodology.
1d	Non-renewable biomass has been used in the project region since 31 December 1989, using survey methods or referring to published literature, official reports or statistics.	Each PAI will demonstrate that Non-renewable biomass has been used in the project region since 31 December 1989.	Publicly available studies ^{8,9} are being used to ascertain biomass usage for the PAI within the GP.
1e	For the specific case of biomass residues processed as a fuel (e.g. briquettes, wood chips), it shall be demonstrated that: (a) It is produced using exclusively renewable biomass (more than one type of biomass may be used).	Biomass residues are not processed as a fuel to be used in the GP. End users will be asked to state their source of energy and baseline appliance at the point of distribution and during the project monitoring. Above information will be stored in the monitoring database.	1. Monitoring surveys. 2. Project ICS distribution poster specific to the end-users (sample photographs)

⁸ <https://irpj.euclid.int/articles/the-transition-from-cooking-with-charcoal-to-lpg-gas-in-rwanda-2018-2024/#:~:text=For%20centuries%2C%20the%20Rwandan%20population,problem%20started%20with%20rapid%20deforestation.>

⁹ The usage of firewood as fuel for cooking in years prior to 1989 is mentioned at multiple instances within the research thesis, alongwith the relevant references. <https://edepot.wur.nl/272116>

	(b) The consumption of the fuel should be monitored during the crediting period and (c) Energy use for renewable biomass processing (e.g. shredding and compacting in the case of briquetting) may be considered as equivalent to the upstream emissions associated with the processing of the displaced fossil fuel and hence disregarded.		
1f	The Project Design Document shall explain the proposed method for distribution of project devices including the method to avoid double counting of emission reductions such as unique identifications of product and end-user locations (e.g. programme logo)	To avoid double counting of emission reductions through the method of distribution, each cookstove has a unique identifier number and the distribution of each stove is logged onto a database which includes unique information for each recipient Each PAI will have system for avoiding double counting with data being collected via a smartphone app (where possible), or via paper forms, including: 1. Date of distribution 2. A unique serial number¹⁰ on each technology	1. Project (GP) Distribution database can be checked to verify the distribution approach, along with the distribution system (includes both plan and execution steps) established by the PP. The distribution database is an electronic document system. 2. The VCS GP ICS units will have unique engravings or text specifically mentioning the unit is strictly “not for sale” along with the DelAgua logo.

¹⁰ There are no similar programs running in the host country Rwanda where the same ICS models are distributed by another entity under different program(s). If this is found during the project ICS monitoring or verification, it shall be

		3. Available end-user data: name, phone number, address/physical location, ID number	
1g	The Project Design Document shall also explain how the proposed procedures prevent double counting of emission reductions, for example to avoid that project stove manufacturers, wholesale providers or others claim credit for emission reductions from the project devices.	The End User Agreement will confirm that the ownership rights of the ER/VCUs generated by the PAI reside with the PP. The signature of each end user confirming their understanding of this agreement will be collected at the point of distribution. The End User Agreement will be in English and translated into a local language where required. If necessary, it will be read out to the End User. All rights to distribute the delivered stoves and claim the resultant GHG emissions reductions belong to the PP. The GP will not include any PAI that has been rejected by another GP, or PA-DDs of any other GHG programs.	a) End users will be asked to sign the End User Agreement and this information will be a part of the agreement, and then stored in the monitoring database. b) Each PAI will include a statement on the uniqueness of the Project and by listing other similar activities (from other GHG programme registries) that are taking place within the project boundary to demonstrate its uniqueness.
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.

ensured that double counting is avoided by using distinct nomenclature for the unique ID code of the ICS compared with the different programs, and also making sure that it has a distinct color, label, or marking.

3	Apply the technologies or measures in the same manner as specified in the project description.	The ICS distributed in the PAIs will adhere to the GP description and replace biomass burned in the baseline scenario.	Manufacturer's specifications.
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 the distribution database, which includes the location data of the ICS distributed.	ICS Distribution database
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	The evidence can be provided in the form of the following: a) An analysis of Rwandan government programmes or policy for cookstoves will be conducted in the PAI design document. See Section 3.5. b) The End User Agreement will confirm that the PAI "installs or distributes stoves at zero cost to the end-user and has no other source of

		sale of GHG credits, the project activity shall be deemed additional.	revenue other than the sale of GHG credits.
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 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	The GP does not have any specified capacity limits applicable, since there are no capacity limits defined within the applied methodology, VMR0006, ver. 1.1. Therefore, this eligibility criteria is not applicable.	N/A

	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. Sample list of the beneficiaries that are to be provided the project ICS will be shared. 2. The MoU with the Rwanda government will be shared.
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 eligibility criteria.	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.
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	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.

	applicable set of eligibility criteria and enable sampling by the validation/verification body.		
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.
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, which will show the first distribution date. 3. The distribution database of the GP will provide the start date in the form of the first sales made by the PAI.
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.
13	The new PAI must be eligible for crediting from the start date of the instance through to the end of the	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

	project crediting period (only).		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).
14	The new PAI shall not leave one VCS project and subsequently enroll 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.	This will be evidenced through a declaration signed by the implementer/investor of the PAI that is enrolled under the VCS GP.

1.5 Project Proponent

Organization name	DelAgua Health Rwanda (Voluntary) Limited
Contact person	James Beaumont
Title	Director
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1.6 Other Entities Involved in the Project

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

Organization name	N/A
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Role in the project	-
Contact person	-
Title	-
Address	-
Telephone	-
Email	-

1.7 Ownership

DelAgua Health Rwanda (Voluntary) Limited is the owner of the VCS grouped project activity.

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.

1.8 Project Start Date

The start date for this Grouped Project is 15/09/2014¹¹, however, issuance of credits under VERRA is applicable from 01/01/2019. The timeline relevant to the VCS GP Start Date can be accessed in Appendix-2 of this document.

1.9 Project Crediting Period

The project crediting period will be seven years, twice renewable, for a maximum total of 21 years.

¹¹ The distribution of project ICS began on 07/09/2014, however, the start date of 15/09/2014 was accepted by CDM. PP has considered 15/09/2014 as the Start Date for the VCS GP 2749, as it is conservative compared to the actual start date of distribution of ICS – 07/09/2014.

The first renewable crediting period was from 15-September-2014 to 14-September-2021.

The second renewable crediting period will be from 15-September-2021 to 14-September-2028.

1.10 Project Scale and Estimated GHG Emission Reductions or Removals

Project Scale	
Project	
Large project	☒

Year	Estimated GHG emission reductions or removals (tCO ₂ e)
15-September-2021-31-December-2021	261,409
01-January-2022-31-December-2022	880,356
01-January-2023-31-December-2023	282,745
01-January-2024-31-December-2024	562,637
01-January-2025-31-December-2025	547,686
01-January-2026-31-December-2026	533,018
01-January-2027-31-December-2027	518,630
01-January-2028- 14-September-2028	355,086
Total estimated ERs	3,941,567
Total number of crediting years	7
Average annual ERs	563,081

1.11 Description of the Project Activity

Two PAIs (PAI-1 and PAI-2) have started implementation prior to the time of GP validation. These PAIs are discussed here:

1. The ICS distributed under PAI-1 (may be referred to as Group – 1 interchangeably within this document and the ER Sheet) & PAI-2 (may be referred to as Group – 2 interchangeably within this document) involved EcoZoom Dura model ICS and had a thermal efficiency well above the threshold value of 25%, which is stated as a requirement in Section 4 of the methodology. The efficiency value has stayed above this value throughout the crediting period.
2. Figure below provides the details of the EcoZoom Dura ICS model that was distributed under PAI-1 & PAI-2 and verified by the VVB on-site at the time of first Verification (Joint Validation & Verification). Along with the ICS, a pot skirt is also provided to the end-users, so that the maximum efficiency of the ICS can be attained at the time of cooking.

Figure 1: EcoZoom Dura ICS, & pot skirt distributed under the GP (PAI-1 & PAI-2)



Name of the stove – EcoZoom Dura with Pot Skirt

Stove manufacturer – EcoZoom

Stove Type – Rocket

Stove Body – Cast Iron

Stove height – 32.1 cm

Stove diameter – 24 cm

Thermal efficiency – 44.9%

Stove lifetime – 7 years

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 following ICS models are envisaged to be distributed in the initial PAIs –

Model-1:

Name of the stove – Kuniokoa Generation 2 with Pot Skirt

Stove manufacturer – Burn

Stove Type – Natural Draft

Stove Body – Stainless Steel

Stove height – 32.1 cm

Stove diameter – 28.2 cm

Thermal efficiency – 51.3%

High Power Output – 2.9 KW

Stove lifetime – 10 years

Figure 1: Kuniokoa Stove Model 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. The models of the ICS technologies briefed above are indicative until the actual distribution takes place at the project location. The ICS model selection at PAI level will be based on key attributes such as thermal efficiency, 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 10%.

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).

1.12 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.

1.13 Conditions Prior to Project Initiation

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

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

1.14 Compliance with Laws, Statutes and Other Regulatory Frameworks

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 guidelines¹².

1.15 Participation under Other GHG Programs

1.15.1 Projects Registered (or seeking registration) under Other GHG Program(s)

Every PAI that is being added to this Grouped Project, will be required to demonstrate whether they have been registered, or are seeking registration, under any other greenhouse gas programme.

Where the project activity instance has been (or is simultaneously planning to be) registered under any other greenhouse gas programme, the registration number and details will be provided.

Since PAI-2 was registered under CDM, the information is provided in Appendix – 3 of this PD.

1.15.2 Projects Rejected by Other GHG Programs

The PAIs under this grouped project are not reject by any GHG programme.

1.16 Other Forms of Credit

1.16.1 Emissions Trading Programs and Other Binding Limits

The VCS GP does not reduce GHG emissions from activities that are included in an emissions trading program or any other mechanism that includes GHG allowance trading. The GHG emission reductions and removals generated by the GP will not be used for compliance under any other programs or mechanisms.

1.16.2 Other Forms of Environmental Credit

The VCS GP has not sought or received another form of GHG-related environmental credit, including renewable energy certificates.

1.16.3 Supply Chain (Scope 3) Emissions

The Grouped Project activity doesn't impact the emissions of goods and services in its supply chain and, therefore, Scope 3 emissions are not impacted by this project.

1.17 Sustainable Development Contributions

¹² General Guidelines and Procedure for Environmental Impact Assessment, Republic of Rwanda, November 2006 (See filename: RW_EIA_Guidelines_Final_versionI_Nov_2006)

1.17.1 Sustainable Development Contributions Activity Description

The implementation of PAIs – 1, 2, 3, & 4 led 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 were part of the PAIs – 1, 2, 3, & 4 (Distribution of ICS in Rwanda):

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 was 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 that was monitored to calculate the number of HHs living without access to basic services was 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 will be 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.

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 was 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 is then recorded within the monitoring survey database.

SDG-4: Quality Education

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: 4.7.1 Extent to which (i) global citizenship education and (ii) education for sustainable development are mainstreamed in (a) national education policies; (b) curricula; (c) teacher education; and (d) student assessment

Available Data: (i) Number of project ICS beneficiary HHs who were 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.

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.

SDG-7: Affordable and Clean Energy

Approach: For arriving at the indicator value, we 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.

SDG-8: Decent Work and Economic Growth

Approach: For arriving at the indicator value, we 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.

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.

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.

The SDG impacts of the distribution program and monitoring related discussion is provided in the below sections.

1.17.2 Sustainable Development Contributions Activity Monitoring

Summary description of project activities implemented during the monitoring period that result in SD contributions (i.e., technologies/measures implemented, activity location):

The VCS GP involved PAIs that led to a combined Sustainable Development action through the distribution of ICS units across rural households in Rwanda. The distribution of ICS leads to several direct and positive impacts into the lives of these beneficiary households.

An explanation of how project activities result in the SD contributions described in Table 1 of this report:

The VCS GP impacts the lives of the households in many ways. These are then reviewed by the PP, and it was found out that these impacts from the project activity at every household level may be documented with the help of UN SDGs. Each impact is then mapped against a relevant SDG indicator, which is then planned for the monitoring. Survey questionnaire used for monitoring the project activity includes questions on the SDG impacts, and the responses from the end user acting as respondent to the monitoring survey are then recorded against those. These survey responses recorded are saved in the online survey form, and these are then analysed for 95/10 rule as per the CDM sampling standard requirements.

Identification of which SD contributions described in Table 1 of this report contribute to achieving any nationally stated sustainable development priorities, including any provisions for monitoring and reporting the same:

The VCS GP support the nationally stated sustainable development priorities of the host country, and result in a reduction in the deforestation due to firewood collection and usage for cooking purposes. This supports Rwanda's goal¹³ of reducing the percentage of households using wood fuel and charcoal for cooking from 83.3% in 2014 to 42% in 2024. This directly impacts the SDG-15, indicator 15.4.2 Mountain Green Cover Index, by reducing the firewood cutting from the forests and consequently increasing the forest cover compared with the baseline levels. However, there are no provisions from the host country government on the monitoring and reporting of any of those SDGs.

¹³ <https://www.undp.org/rwanda/rwanda%E2%80%99s-health-and-forests-need-clean-break-cook-stoves>

Table 1: Sustainable Development Contributions¹⁴

Row number	SDG Target	SDG Indicator	Net Impact on SDG Indicator	Current Project Contributions	Contributions Over Project Lifetime
1)	1.4	Indicator 1.4.1: Proportion of population living in households with access to basic services	Implemented activities to increase	PAI-2: 100% of the users who belong to poor income class are found as using project ICS during monitoring surveys.	PAI-1: 98.51% users belong to poor income class used ICS. PAI-2: 99.52% users belong to poor income class used ICS.
2)	3.9	3.9.1 Mortality rate attributed to household and ambient air pollution	Implemented activities to decrease	The proportion of the project population who feel there is a reduction in the household pollution levels were monitored during the surveys. The survey questionnaire has a question¹⁸ specific to the variations observed by the end-user (or family member) in the indoor air pollution levels from the moment they're using the project ICS (compared with the baseline cooking device levels). PAI-2: 99.52% of respondents for Group-2 of users surveyed admitted that they have experienced a reduction in the household pollution levels ever since they started using the project ICS.	PAI-1: Over 97.91% users confirmed reduced smoke level. PAI-2: Over 98.5% users confirmed reduced smoke level.

¹⁴ The SDG contribution from the VCS GP will be provided at the time of Validation. Currently, the monitoring is planned for the project activity.

3)	4.7	Indicator 4.7.1: Extent to which (i) global citizenship education and (ii) education for sustainable development are mainstreamed in (a) national education policies; (b) curricula; (c) teacher education; and (d) student assessment	Implemented activities to increase	i) The number of CHWs that were educated (trained for distribution, 6-monthly household visits, surveys, and training on sustainable cooking practices to be disseminated to end user households) by the Grouped Project remain the same for PAI-2. ii) The number of end users per household that are educated for the stove usage and apply sustainable cooking practices are equal to the exact number of households where project ICS are distributed. No new ICS distribution during current monitoring period.	The number of CHWs trained by the end of M.P.-1 are 4,783. PAI-1: 100,567 people educated PAI-2: 195,227 people educated
4)	5.4	5.4.1 Proportion of time spent on unpaid domestic and care work, by sex, age and location	Implemented activities to decrease	During the current monitoring period, following was observed in terms of reduction in time spent on fuelwood. PAI-2 around 60% household confirms reduction in time for fuel wood collection.	PAI-1-60.89% households saved time for collection of fuel wood PAI-2- 60% households saved time for collection of fuel wood.

5)	7.1	7.1.2 Proportion of population with primary reliance on clean fuels and technology	Implemented activities to increase	The indicator showing the increase in the “proportion of population with primary reliance on clean fuels and technology” will be the number of users who switched to cleaner technology, i.e. project ICS in this case. The parameter will be the number of beneficiaries for a monitoring period. The value will be sourced from the ICS distribution database. There were no new ICS distribution during current monitoring period.	Total 295,794 households switched to improved cookstove due to grouped project
6)	8.3	8.3.1 Proportion of informal employment in total employment, by sector and sex	Implemented activities to increase	The project activity has a database of CHWs working for it. This database is used to provide the actual number of CHWs working for the project activity. The number of permanent employees working on the DelAgua payroll will not act as a part of this indicator since it is only focused on the informal employment. However, the number of estimated people who worked in the manufacturing of these ICS, and those working for the delivery and transportation of these ICS will be considered towards the indicator. Even if the PP is not directly employing the ironsmiths or technicians working on contract at the manufacturer’s facility, purchasing of these stoves will become an indirect source of their income. There is no new employment.	Total 5500 people benefited due to grouped project activity.

7)	13.0	Tonnes of greenhouse gas emissions avoided or removed	Implemented activities to increase	The amount of GHG avoided by the project activity would be considered as final value towards this SDG indicator parameter. During the current monitoring period, the GHG emission reductions from PAI-2 is 1,149,391 tCO₂e.	Total emission reduction due to grouped project activity 3,557,908 tCO ₂ e.
8)	15.4	Indicator 15.4.2 Mountain Green Cover Index	Implemented activities to increase	The project activity is quantifying the woody biomass that is saved from being consumed due to the usage of improved cookstoves by the households in the project activity monitoring period-2 The quantity of woody biomass saved for PAI-2 is 616,562 tons in total for M.P.-2. The forest type in Rwanda is mountain forest ecosystem. Therefore, the project activity is saving a total of 711,630 tons of firewood in the mountain forest ecosystem during the first monitoring period.	Total wood biomass saved as 1,081,663 tons.

1.18 Additional Information Relevant to the Project

Leakage Management

Every project activity instance to be added to this Grouped Project will demonstrate that it has applied the leakage management conditions required by the respective methodologies if these are relevant to the project activity instance. If leakage is not relevant to the project activity instance, then it shall be justified in the project description.

For further information on the application of the leakage factor, please refer Section 4.3 of this document.

Commercially Sensitive Information

All information in this Grouped Project Description is public.

Further Information

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

2 SAFEGUARDS

2.1 No Net Harm

The project undertakes the distribution of improved cook stoves. As per the Laws of Rwanda, the project undertaking such activities does not require any Environmental Impact assessment. This is as per Ministerial Order No. 004/2008: Ministerial Order establishing the list of works, activities and projects that must undertake an environment impact assessment¹⁵. The fact that this project activity does not need environmental assessments, supports that it does not cause environmental harm.

The project, on the contrary, has several positive social and environmental benefits due to its implementation. The project leads to improved indoor air quality, lower air emissions, and also positive health impact.

2.2 Local Stakeholder Consultation

The grouped project activity VCS 2749 is a voluntary initiative that is being implemented in collaboration with the Government of Rwanda (GoR). PP has signed the MoU with the Rwandan

¹⁵ <https://www.elaw.org/rwanda-environmental-impact-assessment-law-and-regulations>

Government to distribute Improved Cooking Stoves (ICS). Due to the MoU signed with the government of Republic of Rwanda, the CHWs act as facilitators of the program. And therefore, they are requested to gather feedback from the local people in the villages within the cells where distribution is expected. The local population is involved in the consultation process when the plans on the distribution for a specific cell (level of jurisdiction, where a cell is classified as a cluster of villages) are finalized by the government.

The Rwandan Government has set a goal to reduce the percentage of households using firewood for cooking from a baseline value of 79.90% in 2017 to 42% by 2024¹⁶, and therefore, PP is supporting the government to reach towards that goal. The MoU that Rwandan government has signed with PP is one of the key initiatives in order to reach the 2024 milestone on mitigating the Climate Change. The use of firewood as a cooking fuel is a common practice, which is impacting the available forest resources through deforestation. The GHG emissions that get released in the atmosphere because of the burning of firewood as cooking fuel is another major reason why this goal was set by the government. Now, since this goal cannot be met without the dissemination of awareness to the local people, the government does the awareness campaigns on clean cooking, and make people aware of the projects that will help them achieve clean cooking. The dissemination is done through informing the local population about the program prior to the actual distribution, through newspaper advertisements, announcement campaigns on the radio, and through the poster campaigns on the district, sector, and cell offices.

There are meetings held with the local government in order to achieve the approval from the government entities involved in the facilitation of the program. These meetings are called JADF (Joint Action Development Forum) meetings. Local population can only be consulted once there is a certain degree of certainty that the distribution is scheduled as planned with the cell government. This degree of certainty is obtained at the time of the conclusion of third JADF meeting (at cell level). The structure of JADF meetings and their requirement is elaborated below.

The JADF meeting:

For the PAIs that are going to be implemented under the GP, DelAgua has signed a Memorandum of Understanding (MOU) with the Government of Rwanda that directs DelAgua to work with local government officials to plan and execute project implementation. The mandate on the implementation of the VCS project activity distribution lies with the district governments in the host country Rwanda. PP cannot visit the new district directly and start the process of the LSC meeting in accordance with the VCS requirements. This is beyond the control of PP, since there are requirements that the project implementer within the district need to fulfil in order to obtain the collaboration agreement from the district government. The initial steps of obtaining the collaboration agreement are similar to the local stakeholder consultation, wherein

¹⁶ <https://www.mininfra.gov.rw/updates/news-details/rwanda-launches-energy-compact-on-clean-cooking-in-partnership-with-sustainable-energy-for-all-at-cop26>

the district government has authority on informing the implementation plan to the key actors, i.e. the local stakeholders. This process is elaborated below.

The JADF meetings are conducted in three stages – 1. Introduction Meeting with the District Office; 2. Signing of the Collaboration Agreement with the District Government; & 3. Discussion on the project Action Plan and distribution schedule.

1. Introduction Meeting with the District Office:

During this meeting, the project activity is elaborated to the district government, and this is point where the district government may raise concerns, if any, over any of the elements of the program. Prior to conducting distributions within a district, DelAgua staff present the project at Introduction Joint Action Development Forum (JADF) meeting, to ensure close collaboration during project implementation. JADF is a mechanism to promote cooperation between the private sector, civil society, and the public sector to advance development at the local level. Participants include private and public sectors, civil society, NGOs, local authorities, faith-based organizations, communities, and others, though participation has been scaled back due to the pandemic. These meetings offer a chance to gather feedback on program design and coordinate the project activities with other activities planned within the district (where the distribution is planned).

To date, DelAgua has been part of the JADF in the following districts:

- Gicumbi district on 10/01/2022
- Gakenke district on 11/01/2022
- Nyagatare district on 09/02/2022
- Musanze district on 08/02/2022

2. Signing of Collaboration Agreement with the District Government:

Following the introduction meeting(s), a Collaboration Agreement is signed between the District and DelAgua that commits officials throughout the district to support the project, by:

- Providing DelAgua with access to local Community Health Workers (CHWs), who are trained by DelAgua staff to help implementing the project
- Providing DelAgua with a list of beneficiaries that will receive stoves under its program.
- Spreading awareness of the project amongst the Rwandan population.

During this meeting, PP receives signed Collaboration Agreements from the district governments. JADF consultations will keep taking place for the districts as the program expands further.

DelAgua has received the JADF collaboration agreement in the following districts:

- Gicumbi district on 26/01/2022

- Gakenke district on 17/01/2022
- Nyagatare district on 13/02/2022
- Musanze district on 16/02/2022

3. Discussion on the project Action Plan and distribution schedule:

Once the Collaboration Agreement is signed between the District Government and the PP, the plan for distribution of project technology is discussed between them. During this meeting, the expected dates for scheduling the distribution and the expected number of beneficiaries are informed by the cell government to the PP.

The third JADF meetings with the relevant stakeholders for cell level distribution planning took place in the month of April 2022¹⁷.

Continuation of meetings with the stakeholders:

The program once approved by a district government, goes through the similar exercise of the JADF meetings at the Sector level, where the Project Coordinators are the representatives of PP at the meeting. The agreed plan then is informed to the Sectors that are within a District, and then the meetings are held with the Sector government office similar to the district meetings. This is further repeated at the cell level, where the meetings are held within the cells where the end-users are going to receive the project ICS.

In summary, when these district level JADF meetings are over, and the collaboration agreement is signed between the parties, PP moves to the Sector level for the similar stakeholder meetings, and further to the Cell level after the Sector meetings are over.

At the district level, PP is represented by the Country Director, whereas at the Sector level Project Coordinators attend the meetings, and at the cell level district managers attend the stakeholder meetings.

The project ICS distribution plan is discussed with the government officials at different levels and stakeholders present in this meeting.

Stakeholder meetings that take place for the Local Stakeholder Consultation:

There are 3 meetings held at the district, sector, and cell level, where the relevant stakeholders are informed about the project activity, its impacts, and the plans on distribution.

However, the local population, who are expected to receive the project ICS through the distribution program, do not get any chance to communicate with the PP until the formal notice of the project activity distribution schedule is shared with them through the cell and the village

¹⁷ The minutes of third JADF meeting (alongwith the list of attendees) for Nyagatare district are shared with the VVB.

officials. This is mainly due to the fact that without any final planned schedule, PP cannot simply go on-site and ask the people to provide their feedback. This takes place in a systematic manner, where the feedback is requested from the local population by the cell offices, or they can also provide their feedback to the PP through the CHWs prior to the distribution (implementation of the program).

Once the local people are informed of the project activity distribution date, they are requested to provide their feedback at the cell office, or may also inform the PP through the CHW network available in their cell. This way, the local stakeholders may register their concern, feedback, complaint, or remarks through the CHWs, prior to the distribution activity taking place.

Concerns from the local population on the ICS distribution:

Based on the PP's experience on distribution planning and conducting the stakeholder meetings for upcoming PAIs, there are no concerns from the people prior to the distribution, except for any corrections/edits required for their names in the distribution household list. Since the distribution list is developed from the list of households registered under the government national register, and the list is only updated once every 4 years, it is quite possible that there may be some omissions or additions required in the list. The list is updated at the time of pre-distribution validation event, and most of the concerns of the local people are in the form of their name in the list of beneficiaries. Support from CHWs and the cell, sector & district offices is sought in arriving at the validation of the number and identity of the beneficiaries. This way, the most common concern of the end-users is resolved (though not recorded and saved because of the unavoidable logistic and operational workload) at the time of distribution.

The increase or decrease in the number of ICS planned for a cell, sector, or district are rearranged by the PP teams, making sure that there is no anticipated end-user left out of the distribution activity.

This way, the Local Stakeholder Consultation is conducted in the form of a series of meetings, where all the relevant stakeholders are informed about the project activity prior to its implementation, and they all are requested to provide their valuable feedback during these meetings. The feedback from all the stakeholders involved is invited, at different levels, based on the VCS requirements.

The information shared above shall be deemed sufficient to conclude that the consultation from the relevant stakeholders is recorded, both by the PP and the cell level offices of the districts.

Procedures for Ongoing communication with the local stakeholders:

Following are the channels through which the stakeholders can communicate with DelAgua.

DelAgua Call Center Phone Number: Aiding the local people in regional language Kinyarwanda, international languages English & French. This can be evidenced through the distribution poster shared with the end user. The distribution poster includes the call center phone number and is informed to the end user.

DeLaqua email id: DeLaqua email is another source of connection through which the end users can connect with them.

Through CHWs: The Community Health Workers are the point of contact for the end users in case they have to communicate with DeLaqua. They rely on them, mainly because of the personal connect they have with them. CHWs are generally among the local villagers themselves, and therefore, it is easier for them to connect with the end users.

Apart from the mechanism available for local stakeholders connecting with the DeLaqua, the follow-up visits by the DeLaqua staff are also undertaken to user households.

During the current monitoring period, no feedback/grievance was received by stakeholders.

2.3 Environmental Impact

The project undertakes the distribution of improved cook stoves. As per the Laws of Rwanda, the project undertaking such activities does not require any Environmental Impact assessment. This is as per Ministerial Order No. 004/2008: Ministerial Order establishing the list of works, activities and projects that have to undertake an environment impact assessment.¹⁸

2.4 Public Comments

This Grouped Project was available for public comment during the period 17 March 2022 – 16 April 2022. The public consultation period is over, and no comments were received during this period.

2.5 AFOLU-Specific Safeguards

This Grouped Project does not allow for AFOLU project activity instances, and therefore, this section is not applicable.

3 APPLICATION OF METHODOLOGY

3.1 Title and Reference of Methodology

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

¹⁸ <https://www.elaw.org/rwanda-environmental-impact-assessment-law-and-regulations>;

Specific URL to the Order No. 004/2008:

<https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Felaw.org%2Fsystem%2Ffiles%2Fattachments%2Fpublicresource%2FMINISTERIAL%2520ORDER%2520N%25C2%25B0004%2520ESTABLISHING%2520THE%2520LIST%2520OF%2520WORKS.docx&wdOrigin=BROWSELINK>

VMR0006 Methodology for Installation of High Efficiency Firewood Cookstoves – version 1.1

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

- CDM TOOL01 “Tool for the demonstration and assessment of additionality” Version 07;
- CDM TOOL11 “Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period” Version 03.0.1
- CDM TOOL21 “Demonstration of additionality of small-scale project activities” Version 13.1;
- CDM TOOL30 “Calculation of the fraction of non-renewable biomass” Version 04;
- CDM Guideline “Sampling and surveys of CDM project activities and programmes of activities” version 04;
- CDM Standard “Sampling and surveys for CDM project activities and programmes of activities” version 09.

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.

Table 5: Fulfilment of VMR0006, ver. 1.1 Applicability criteria for PAIs to be included

S. No.	Applicability Condition	Justification of applicability
1	Project activities shall be implemented in domestic premises or in community-based kitchens.	Each PAI will distribute technology that is appropriate for domestic use to household end users
2	The project stove shall have specified high-power thermal efficiency of at least 25% per the manufacturer’s specifications and shall exclusively use woody biomass and can be single pot or multi-pot; in case of project stove replacing fossil fuel baseline stove, it shall exclusively use renewable biomass.	ICS distributed in each PAI will have a thermal efficiency of at least 25% Each PAI will record the baseline and project fuel use to ensure that wood fuel is the sole source of energy.
3	Both ‘Projects’ and ‘Large Projects’ can use the methodology	PAIs will comply with the GP requirements

4	Non-renewable biomass has been used in the project region since 31 December 1989, using survey methods or referring to published literature, official reports or statistics.	Each PAI will demonstrate that Non-renewable biomass has been used in the project region since 31 December 1989.
5	For the specific case of biomass residues processed as a fuel (e.g. briquettes, wood chips), it shall be demonstrated that: (a) It is produced using exclusively renewable biomass (more than one type of biomass may be used). (b) The consumption of the fuel should be monitored during the crediting period and (c) Energy use for renewable biomass processing (e.g. shredding and compacting in the case of briquetting) may be considered as equivalent to the upstream emissions associated with the processing of the displaced fossil fuel and hence disregarded.	Biomass residues are not processed as a fuel to be used in the GP.
6	The Project Design Document shall explain the proposed method for distribution of project devices including the method to avoid double counting of emission reductions such as unique identifications of product and end-user locations (e.g. programme logo)	In order to avoid double counting of emission reductions through the method of distribution, each cookstove has a unique identifier number and the distribution of each stove is logged onto a database which includes unique information for each recipient Each PI will have system for avoiding double counting with data being collected via a smartphone app (where possible), or via paper forms, including: 4. Date of distribution 5. A unique serial number on each technology

		Available end-user data: name, phone number, address/physical location, ID number
7	The CDM-PDD or CDM-PoA-DD/CPA-DD shall also explain how the proposed procedures prevent double counting of emission reductions, for example to avoid that project stove manufacturers, wholesale providers or others claim credit for emission reductions from the project devices.	The End User Agreement confirms that the ownership rights of the ER/Vcus generated by the PAI reside with the PP. The signature of each end user confirming their understanding of this agreement will be collected at the point of distribution. The End User Agreement will be in English and translated into a local language where required. If necessary, it will be read out to the End User. All rights to distribute the delivered stoves and claim the resultant emissions reductions belong to the PP. The GP will not include any PAI that has been rejected by another GP, or PA-DDs of any other GHG programs.

Tool 30 - Calculation of the fraction of non-renewable biomass

Applicability criterion	How the project complies
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.
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	The PP has chosen host country Rwanda as region for the project activity.

included in the project activity and justify the selection of the area in CDM project design documents. For region- or country-specific fNRB values, DNAs shall specify the applicable area.	
Project participants and DNAs may choose between the following two options to determine the value of fNRB: (a) Use the default value as provided in TOOL33; or (b) Calculate fNRB 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 fNRB 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 fNRB for host country. Please refer Appendix for calculation details and comparison with literature.

b) Below is the methodological applicability criteria for the PAIs that are undergoing monitoring in the VCS grouped Project Activity 2749, i.e. PAI-2.

Table 6: Fulfilment of VMR0006, ver. 1.1 Applicability criteria for PAI-2

S.No.	Applicability Condition	Justification of applicability
1	Project activities shall be implemented in domestic premises or in community- based kitchens	PAI-2 have distributed ICS to the households in Rwanda in 2016.
2	The project stove shall have specified high-power thermal efficiency of at least 25% per the manufacturer's specifications and shall exclusively use woody	ICS distributed under PAI-2 have the thermal efficiency >25%, which is evident from the respective year of the monitoring applicable to the ICS life. All the applied values during

	biomass and can be single pot or multi-pot; in case of project stove replacing fossil fuel baseline stove, it shall exclusively use renewable biomass.	the second monitoring period are >25% thermal efficiency value. The woody biomass usage is monitored during the first monitoring period, at both baseline level as well as project level. This can be verified from the monitoring surveys for PAI-2.
3	Both 'Projects' and 'Large Projects' can use the methodology	PAI-2 within the GP are categorised under large scale project.
4	Non-renewable biomass has been used in the project region since 31 December 1989, using survey methods or referring to published literature, official reports or statistics.	The PAI-2 are implemented in the host country Rwanda, and it has already been mentioned in Section 1.4 by using the available literature that the host country Rwanda has been using firewood as a source of fuel for their cooking requirements.
5	For the specific case of biomass residues processed as a fuel (e.g. briquettes, wood chips), it shall be demonstrated that: (a) It is produced using exclusively renewable biomass (more than one type of biomass may be used). (b) The consumption of the fuel should be monitored during the crediting period and (c) Energy use for renewable biomass processing (e.g. shredding and compacting in the case of briquetting) may be considered as equivalent to the upstream emissions associated with the processing of the displaced fossil fuel and hence disregarded.	This is not applicable for the PAI-2.
6	The Project Design Document shall explain the proposed method for distribution of project devices including the method to avoid double counting of emission reductions such as unique identifications of product and end-	In order to avoid double counting of emission reductions through the method of distribution, each cookstove has a unique identifier number and the distribution of each stove is logged onto a database which includes unique information for each recipient

	user locations (e.g. programme logo)	Both PAI-2 was implemented with the system for avoiding double counting, with data being collected via a smartphone app, including: 1. Date of distribution 2. A unique serial number on each technology 3. Available end-user data: name, phone number, address/physical location, ID Number
7	The CDM-PDD or CDM-PoA-DD/CPA-DD shall also explain how the proposed procedures prevent double counting of emission reductions, for example to avoid that project stove manufacturers, wholesale providers or others claim credit for emission reductions from the project devices.	The End User Agreement confirms that the ownership rights of the ERU/VCUs generated by the PAI-2 reside with the PP. The signature of each end user confirming their understanding of this agreement is collected at the point of distribution. The End User Agreement is bilingual, i.e. in English as well as translated into the local language Kinyarwanda. In cases where the end-user was unable to understand the agreement, it was read out to them for the sake of their clarity. All rights to claim the resultant emissions reductions for the ICS under the PAI-2 belong to the PP.

3.3 Project Boundary

The Grouped Project boundary is defined as per the applied methodology VMR-0006, ver. 1.1.

Table 7: The GHG sources & sinks within the project boundary

Source	Gas	Included?	Justification/Explanation
Baseline	CO ₂	Yes	Major source
	CH ₄	Yes	Major source
	N ₂ O	Yes	Major source
	Other	No	No other source identified
Project	CO ₂	Yes	Major source
	CH ₄	Yes	Major source

Source	Gas	Included?	Justification/Explanation
Biomass for household cooking requirements)	N ₂ O	Yes	Major source
	Other	No	Not applicable

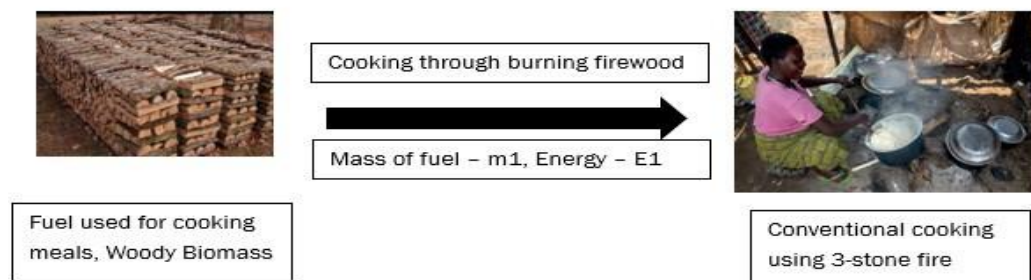
Figure 4: Project boundary map showing physical locations of the Grouped Project distribution



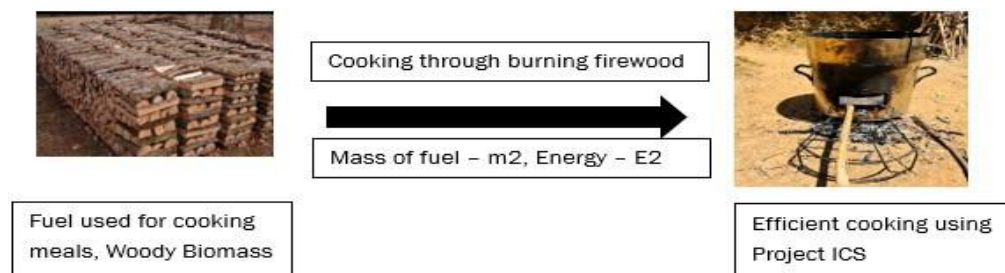
As per the template requirements, the diagram of the equipments distributed under the grouped project is provided in Section 1.

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

Baseline Scenario:



Project Scenario:



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

The change in energy consumed for cooking between baseline and project scenario is $E_1 < E_2$.

The systems that were applied for the distribution activity to take place, are described in the Section 5.3 of this document.

3.4 Baseline Scenario

As per paragraph 3.9.8 of the VCS Standard (version 4.4), “Where it is determined that the original baseline scenario is still valid, the GHG emissions associated with the original baseline scenario shall be reassessed using the latest version of the CDM Tool to assess the validity of the original/current baseline and to update the baseline at the renewal of a crediting period.”

For this Tool 11, “Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period (version 03.0.1)” has been used. The tool provides a step wise procedure to evaluate validity of the baseline and to update the baseline for the new crediting period. The validity of the baseline is assessed by the following steps:

Step 1: Assess the validity of the current baseline for the next crediting period:

The validity of the current baseline is assessed using the following Sub-steps:

Step 1.1: Assess compliance of the current baseline with relevant mandatory national and/or sectoral policies

The current baseline is in compliance with the national and sectoral policies of the host country. There is no mandate imposed by the government of Rwanda on distribution of improved cookstove to the households.

In the absence of the project activity households would have continued the practice of usage of conventional inefficient stoves¹⁹. There have been no changes in policies which could impact the applicability of the baseline scenario of the project activity. Thus, the current baseline is in compliance with the relevant policies.

Step 1.2: Assess the impact of circumstances

At the time of validation of the project activity, the baseline scenario was the continuation of current practices. In this case, this would mean that, if the project proponent would not have invested in the project equivalent amount of CO₂ emission would have been generated. There are no rules by government of Rwanda which mandate the investor on selection of this technology and distributing them to the households. The project activity is completely voluntary.

¹⁹ <https://www.reg.rw/what-we-do/biomass/>

Furthermore, the project proponent has taken the latest data for f_{NRB} calculations at the time of renewal of the crediting period, which itself considered all the new circumstances. Hence, the new circumstances do not have an impact on the baseline emission.

Apart from the above, there are several documentary evidences in the form of recently published reports and papers that can support the fact that the project's baseline was usage of firewood and unimproved cooking devices.

Some of these are listed below:

1. Ministry of Infrastructure: Biomass accounts for 85% of all energy consumed²⁰. Under the National strategy for transformation, the sector objective is to halve the number of households using traditional cooking technologies to achieve a sustainable balance between supply and demand of biomass through promotion of most energy efficient technologies.
2. Rwanda Integrated Household Living Conditions Survey, EICV5: In rural areas, firewood remains the most common type of cooking fuel, used by 93% of the households²¹.
3. Rwanda first Biennial Report to UNFCCC: Biomass (mostly wood fuel), is the most used fuel in households for cooking (83 % of households in 2019) and as a source of energy (86.3 % in 2016/2017)²².

Thus, the people of Rwanda are still dependent of fuelwood for cooking and other thermal purposes. Thus, baseline scenario remains the same.

Step 1.3: Assess whether the continuation of use of current baseline equipment(s) or an investment is the most likely scenario for the crediting period for which renewal is requested

This step is not applicable as the project was a new investment by the project proponent.

Step 1.4: Assessment of the validity of the data and parameters:

For the project activity, the f_{NRB} to be determined only once for the crediting period. The parameter is calculated based on geospatial surveys. The results which arise from such surveys has been taken as the values for the parameters which re appropriate.

Steps 1.1, 1.2, 1.3 and 1.4 demonstrate that while the baseline scenario remains unchanged, the f_{NRB} value needs to be updated as per the survey results.

Thus, the parameters have been updated accordingly.

Step 2: Update the current baseline and the data and parameters

²⁰ <https://www.mininfra.gov.rw/digital-transformation-1-1>

²¹ <https://www.statistics.gov.rw/publication/eicv-5-main-indicators-report-201617>

²² https://unfccc.int/sites/default/files/resource/Rwanda%20First%20Biennial%20Update%20Report_Final_V.pdf

As it is seen from Step 1 that the current baseline needs to be updated, the following sub-steps are used.

Step 2.1: Update the current baseline:

As per the latest version of the approved methodology, VMR0006, version 1.1, the baseline scenario is same as that of the registered VCS-PD. Hence, the current baseline is not required to be updated. As the same version of methodology was used at the time of validation of the project, there is no change in the terminology of any parameters too.

Also, there has been no change in the design or technical parameters of the project activity. Thus, the baseline of the project activity remains the same as that of the registered PD.

Step 2.2: Update the data and parameters:

The applicable parameters, i.e., B_{old} , η_p , Lifespan, $NCV_{biomass}$, $EF_{WT\ CO_2}$, $EF_{WT\ non-CO_2}$, Leakage factor, f_{NRB} , have been updated accordingly.

Data source for the key parameters used to calculate emission reductions is furnished below.

Key Parameter	Value	Data Source
B_{old}	Annual quantity of woody biomass that would have been used in the household in the absence of the project activity to generate useful thermal energy equivalent to that provided by the project devices	Baseline KPTs, conducted according to KPT Version 4.0
η_p	Efficiency of project stove at the start of project activity	Certification by the Centre for Research in Energy and Energy Conservation (CREEC) lab. CREEC is a certifying agent recognized by the Rwandan Standards Bureau (RSB).

Lifespan	State the operating lifetime of project device for projects	Manufacturer's specifications
NCV _{biomass}	Net calorific value of the non-renewable woody biomass	IPCC Default value
EF _{WT CO2}	CO ₂ emission factor for woody biomass	IPCC Default value.
EF _{WT non-CO2}	Non-CO ₂ emission factor for woody biomass	IPCC Default value.
Leakage factor	Net to gross adjustment factor to account for the leakage	Default value as per methodology
f _{NRB}	Fraction of woody biomass that can be established as non-renewable biomass	As per geospatial survey of the project area.

The actual emission reductions will be calculated ex post, based records and data, which are reliable and verifiable.

3.5 Additionality

The Additionality for Improved Cookstoves is demonstrated using the requirements provided in the methodology VMRO006 Methodology for Installation of High Efficiency Firewood Cookstoves – version 1.1

As per the Para-7, step-2 of the methodology VMRO006, the applicability conditions described within the methodology represent the positive list. The project must demonstrate that it meets all of the applicability conditions of the methodology as well as the below condition. In so doing, the project is deemed as complying with the positive list. The project's compliance to applicability conditions has been demonstrated in section 3.2 above. In addition, the project meets the below condition:

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.

In case of this VCS grouped project activity, all the improved cookstoves are being distributed at zero cost to the end user.

Hence, as discussed above, distribution of Improved cook stoves within the boundaries of Rwanda may be established as additional.

Therefore, the Grouped project activity is deemed additional.

3.6 Methodology Deviations

Not applicable.

4 IMPLEMENTATION STATUS

4.1 Implementation Status of the Project Activity

The registered VCS grouped project has included PAI-1 and PAI-2, wherein operational lifetime of ICS included under PAI-1 has ended during first periodic verification. During current monitoring period the ICS distributed under PAI-2 i.e. 195,227 ICS considered for emission reduction calculation being distribution between 01 March 2016 to 02 November 2016 are operating successfully, further PP will distribute additional 100,000 ICSs (2023-24-50,000 ICSs: 2024-25-50,000 ICSs) under PAI-3. The operation of stoves was confirmed by a survey undertaken as part of monitoring requirements of VCS PD and it was found that all the stoves are in use and there was no case of drop out identified during the survey. The results are survey are demonstrated in the ER spreadsheet and shall be furnished to VVB for verification. The first cookstove under this project distributed on 01 March 2016, the cookstoves were distributed in the targeted area for the project. The monitoring survey was undertaken in 28-February-2023 to 04-March-2023 by visiting the sampled households. Sample size was selected by using the latest version 4 of CDM guideline, "Sampling and surveys for CDM project activities and programmes of activities" version 04. The surveyors visited the houses and completed the survey.

5 ESTIMATED GHG EMISSION REDUCTIONS AND REMOVALS

5.1 Baseline Emissions

The applied methodology VMR0006, ver. 1.1 does not account for baseline emissions separately, rather quantifies emission reductions as a function of the reduction in the amount of non-renewable biomass fuel consumption in the efficient project stoves as compared to baseline stoves. See section 5.4 below.

5.2 Project Emissions

The applied methodology VMR0006, ver. 1.1 does not account for project emissions separately, rather quantifies emission reductions as a function of the reduction in the amount of non-renewable biomass fuel consumption in the efficient project stoves as compared to baseline stoves. See section 5.4 below.

5.3 Leakage

Leakage shall be considered as default 0.95 in accordance with section 8.3 of VMR0006.

5.4 Estimated Net GHG Emission Reductions and Removals

Equations used for Improved Cookstove as per VMR0006

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

Equation (1)

Where:

i = Indices for the situation where more than one type/model of improved cook stove is introduced to replace three-stone fire

j = Indices for the situation where there is more than one batch of improved cook stove of type i

ER_y = Emission reductions during year y in t CO₂e

$ER_{y,i,j}$ = Emission reductions by improved cook stove of type i and batch j during year y in t CO₂e

$$ER_{y,i,j} = B_{y,savings,i,j} \times f_{NRB,y} \times NCV_{woodfuel} \times (EF_{wfCO2} + EF_{wfnon-CO2}) \times N_{y,i,j} \times 0.95 \quad \text{Equation (2)}$$

Where:

$B_{y,savings,i,j}$ = Quantity of woody biomass that is saved in tonnes per improved cook stove of type i and batch j during year y

$f_{NRB,y}$ = Fraction of woody biomass that can be established as non-renewable biomass (fNRB)

$N_{woodfuel}$ = Net calorific value of the non-renewable woody biomass that is substituted or reduced (IPCC default for wood fuel, 0.0156 TJ/tonne)

$EF_{wf\ CO_2}$ = CO₂ emission factor for the use of wood fuel in baseline scenario (IPCC default for wood fuel, 112 tCO₂/TJ)

$EF_{wf\ non-CO_2}$ = Non-CO₂ emission factor for the use of wood fuel in baseline scenario (IPCC default for wood fuel, 26.23 tCO₂/TJ)

$N_{y,i,j}$ = Number of improved cook stoves of type i and batch j operating during year y

0.95 = Discount factor to account for leakage

The quantify of woody biomass saved $B_{y,savings,i,j}$ due to implementation of improved cook stoves will be estimated as follows:

$$B_{y,savings,i,j} = B_{old} \times (1 - \eta_{old} / \eta_{new,i,j}). \quad \text{Equation (3)}$$

Where:

B_{old} = Annual quantity of woody biomass that would have been used in the absence of the project activity (in tonnes per device) to generate useful thermal energy equivalent to that provided by the improved cook stove. The value of B_{old} has been sourced from baseline field surveys.

η_{old} = Efficiency of baseline cookstove

$\eta_{new,i,j}$ = Efficiency of the improved cook stove type i and batch j determined through water boiling test (WBT).

Efficiency of the improved cookstove will be updated as per equation below:

$$\eta_{new,i,y} = \eta_p \times (DF\eta)^{y-1} \times 0.94 \quad \text{Equation (4)}$$

Where:

η_p = Efficiency of project stove (fraction) at the start of project activity

$DF\eta$ = Discount factor to account for efficiency loss of project cookstove per year of operation (fraction). This value may be based on actual monitoring or based on manufacturer's declaration on expected loss in efficiency or through publicly available literature on relevant industry standards. Alternatively default value of 0.99 efficiency loss per year can be considered.

0.94 = Adjustment factor to account for uncertainty related to project cookstove efficiency test.

If project households continue to use baseline cookstoves along with improved cookstoves, B_{old} shall be adjusted ex-post based on the percentage of project households found to continue such practice according to Equation 6 below. For such cases, the quantity of woody biomass saved $B_{y,savings,i,j}$ due to implementation of improved cook stoves shall be calculated using an adjusted value to account for ex-post use of baseline stoves in addition to improved cookstove.

$$B_{old,adjusted} = B_{old} \times (1 - \mu_y) \quad \text{Equation (5)}$$

Where:

$B_{old,adjusted}$ = Adjusted B_{old} to account the ex-post usage of firewood in baseline cookstove(s) by project households in addition to improved cookstove (in tonnes per device)

μ_y = Baseline stove usage factor to account for use of baseline cookstoves along with improved cookstoves.

Sample VCU estimates (based on the calculation for first year of ICS monitoring estimates):

If the baseline stove usage is 10.0% of the total cooking in the first year, then the factor μ_y will be 0.1. The B_{old} value is applied using the available baseline data.

Based on the above,

$$B_{old,adjusted} = 4.409 \times (1 - 0.1) \text{ tonnes/year}$$

$$\text{Or } B_{old,adjusted} = 3.968 \text{ tonnes/year}$$

$$B_{y,savings,i,j}^{23} = 3.968 \times (1 - (0.1/0.4727)) \text{ ton firewood/household/annum}$$

$$\text{Or } B_{y,savings,i,j} = 3.129 \text{ ton firewood/household/annum}$$

$$ER_{y,i,j} = B_{y,savings,i,j} \times f_{NRB,y} \times NCV_{woodfuel} \times (EF_{wf \text{ CO}_2} + EF_{wf \text{ non-CO}_2}) \times N_{y,i,j} \times 0.95$$

$$ER_{y,i,j} = 3.129 \times 0.91 \times 0.0156 \times (112+26.23) \times 1 \times 0.95$$

$$ER_{y,i,j} = 5.83 \text{ ton CO}_2/\text{annum}^{24}.$$

Detailed calculations on the VERs, for both (i) estimates throughout the crediting period, and (ii) actual VERs obtained in the first monitoring period, are provided in the ER Sheet.

²³ Assuming here that all the ICS distributed were of Kuniokoa model (bearing 51% thermal efficiency), and there was no loss in efficiency due to the non-usage of pot skirt.

²⁴ The sample calculations are for Kuniokoa ICS distribution, and ERs are calculated for its first year of operations. In the sample calculations, the accounting of discount factors such as drop-off factor and the skirt usage rate were not accounted.

Emission Reduction Estimate for Improved Cookstove²⁵

Year	Estimated baseline emissions or removals (tCO ₂ e)	Estimated project emissions or removals (tCO ₂ e)	Estimated leakage emissions (tCO ₂ e)	Estimated net GHG emission reductions or removals (tCO ₂ e)
15-September-2021-31-December-2021	261,409	-	-	261,409
01-January-2022-31-December-2022	880,356	-	-	880,356
01-January-2023-31-December-2023	282,745	-	-	282,745
01-January-2024-31-December-2024	562,637	-	-	562,637
01-January-2025-31-December-2025	547,686	-	-	547,686
01-January-2026-31-December-2026	533,018	-	-	533,018
01-January-2027-31-December-2027	518,630	-	-	518,630
01-January-2028-14-September-2028	355,086			355,086
Total	3,941,567	-	-	3,941,567

The VCS methodology, VMR0006 is applicable to both 'Projects' and 'Large Projects'. Hence there are no limits on volume of credits from Improved Cookstove component that can be certified per annum.

6 MONITORING

²⁵ For the crediting period estimates, due consideration was given to the discount factors, thus using realistic figures for the project scenario.

6.1 Data and Parameters Available at Validation

Data/parameter fixed ex-ante for Improved Cookstove instances

Data / Parameter	Bold
Data unit	tons/annum
Description	Annual quantity of woody biomass that would have been used in the household in the absence of the project activity to generate useful thermal energy equivalent to that provided by the project devices
Source of data	Baseline KPTs, conducted according to KPT Version 4.0
Value applied:	4.4092 ²⁶
Justification of choice of data or description of measurement methods and procedures applied	The sampling plan utilized multi-stage sampling. The primary sampling unit was rural villages in Northern, Southern, Eastern, Western Provinces, and the secondary sampling unit was households. 5 households were randomly selected from 25 randomly selected villages. All KPTs were conducted by a team trained by Berkeley Air Monitoring Group. The results presented above met the required 90/10 confidence/precision.
Purpose of Data	Calculation of emission reductions
Comments	Bold will remain fixed for the entire crediting period.

Data / Parameter	η_p
Data unit	Fraction
Description	Efficiency of project stove at the start of project activity
Source of data	Certification by the Centre for Research in Energy and Energy Conservation (CREEC) lab. CREEC is a certifying agent recognized by the Rwandan Standards Bureau (RSB).

²⁶ A baseline firewood consumption of 12.08 kg/HH/day converted into tons/hh/annum. Calculations may be checked in the ER Sheet.

Value applied:	1) Kuniokoa Generation 2: 0.4387 for project stove without skirting²⁷ 0.51 for project stove with pot skirting²⁸ Dura Woodstove 0.449 for project stove with skirting²⁹ 0.409 for project stove without pot skirting³⁰
Justification of choice of data or description of measurement methods and procedures applied	This data is fixed ex-ante as per applied methodology VMR0006.
Purpose of Data	Calculation of emission reductions
Comments	If a pot-skirt is distributed with the project stove, the parameter will be calculated as a weighted average of the efficiency of a skirted stove and an unskirted stove.

Data / Parameter	Life Span
Data unit	Years
Description	State the operating lifetime of project device for projects opting Equation 6 (above) for updating project stove efficiency during project crediting period.
Source of data	Manufacturer's specifications
Value applied:	1) Burn Kuniokoa Generation 2 = 10 years 2) Dura Woodstove=7 years
Justification of choice of data or description of	N/A

²⁷ Certification report provided to the VVB

²⁸ Certification report provided to the VVB

²⁹ Certification report provided to the VVB

³⁰ Certification report provided to the VVB

measurement methods and procedures applied	
Purpose of Data	Calculation of emission reductions
Comments	PP is considering the upper limit of the project ICS model Dura lifetime, as the lifetime of the Dura provided under the technical specifications is 6-7-year range. The reason for considering the upper limit of the ICS lifetime range for this GP is the PP's experience with the actual usage of the ICS model on-site. During the first monitoring period surveys (in late 2021), it has been found that a significant number of project ICS are still working, and people are using them for cooking. Discarding/abandoning the ICS for ER calculations, which are in use in the 7th year of their life does not seem viable for a project activity which is solely relying on the carbon finance for its sustenance, and the livelihoods of the employees working under the project activity. Using the lower end of the lifespan may have negative implications for the program's revenue stream

Data / Parameter	NCV _{biomass}
Data unit	TJ/ton
Description	Net calorific value of the non-renewable woody biomass
Source of data	IPCC
Value applied:	0.0156 TJ/tonne
Justification of choice of data or description of measurement methods and procedures applied	Default value as per VMR0006 version1.1
Purpose of Data	Calculation of emission reductions
Comments	N/A

Data / Parameter	EF _{wf CO2}
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Data unit	ton CO ₂ /TJ
Description	CO ₂ emission factor for woody biomass
Source of data	IPCC
Value applied:	112
Justification of choice of data or description of measurement methods and procedures applied	Default value as per VMR0006 version1.1
Purpose of Data	Calculation of emission reductions
Comments	N/A

Data / Parameter	$EF_{wf\ non-CO_2}$
Data unit	ton CO ₂ /TJ
Description	Non-CO ₂ emission factor for woody biomass
Source of data	IPCC
Value applied:	26.23
Justification of choice of data or description of measurement methods and procedures applied	Default value as per VMR0006 version1.1
Purpose of Data	Calculation of emission reductions
Comments	N/A

Data / Parameter	Leakage Factor
Data unit	Fraction

Description	net to gross adjustment factor to account for the leakage
Source of data	Default as per VMR0006, ver. 1.1, Section 8.3
Value applied:	0.95
Justification of choice of data or description of measurement methods and procedures applied	In-line with the applied methodology VMR0006, ver. 1.1 Section 8.3.
Purpose of Data	Calculation of emission reductions
Comments	N/A

Data / Parameter	$f_{NRB,y}$
Data unit	Fraction
Description	Fraction of woody biomass that can be established as non-renewable biomass
Source of data	Third party fNRB report in line with TOOL30 Version-4
Value applied	0.91
Justification of choice of data or description of measurement methods and procedures applied	The value is sourced from third party report on fNRB for host country Rwanda, wherein the value calculated using publicly available data and geospatial data for Rwanda.
Purpose of Data	Calculation of emission reductions
Comments	The value is fixed ex-nate.

6.2 Data and Parameters Monitored

Data / Parameter	$N_{y,i,j}$
Data unit	Number

Description	Number of project devices of type i and batch j operating during year y
Source of data	Monitoring surveys
Description of measurement methods and procedures applied	Measured directly from Project database. A discount shall be applied based on the percentage of devices that are operational during the monitoring period, as determined by the sample survey. For instance, if survey results show that 10% of the devices are nonoperating, an adjustment factor of 0.9 shall be applied to number of project devices commissioned in a particular batch. Separate samples shall be taken for each batch. Simple random sampling approach will be used in sampling surveys. Minimum sample size will be determined as per the following guidelines: – Project target population < 300: Minimum sample size 30 – Project target population 300 – 1000: Minimum sample size 10% of group size Project target population > 1000: Minimum sample size 100
Frequency of monitoring/recording	Atleast once every two years
Value applied	PAI-2: 195,227 (distributed in 2016) Year-2023-24: 50,000 Year-2024-25: 50,000
Monitoring equipment	Surveys
QA/QC procedures applied	N/A
Purpose of data	Calculation of emission reductions.
Calculation method	N/A
Comments	This parameter only accounts for the number of project ICS that are operating in the monitoring period, and rest of the factors such as discount on non-usage of project ICS, usage of pre-project device, and drop-off are accounted separately, and hence are not reflected with the values provided for this parameter.

Here, the batch j is not segregated in a PAI. Every distribution under a PAI may be considered as a separate batch.

Data / Parameter	η_{old}
Data unit	Fraction
Description	Efficiency of baseline stove
Source of data	Calculated using the Default value as specified in VMR0006 methodology and the data obtained through the distribution surveys
Description of measurement methods and procedures applied	If the device is a three stone fire using firewood (not charcoal), or a conventional device with no improved combustion air supply or flue gas ventilation, that is without a grate or a chimney, a default value of 0.1 is used as per the applied methodology; for other types of devices, a default value of 0.2 is used.
Frequency of monitoring/recording	Fixed for each individual household at first HH visit
Value applied:	0.1
Monitoring equipment	N/A
QA/QC procedures applied	N/A
Purpose of data	Calculation of emission reductions.
Calculation method	N/A
Comments	The value is recorded at the time of distribution, through the distribution survey. If the baseline cooking device is traditional device (e.g. Rondreza) or a 3 stone fire, without any grate or chimney, then as per VMR0006, ver. 1.1, the applied value will be 0.1. In case there is any other unimproved cooking device identified as baseline cooking device, then the applied value for the parameter will be 0.2.

	The average of the η_{old} recorded for total project ICS households (in the distribution surveys) will be calculated for VCU calculations. For ex-ante estimates, the applied value is 0.1 (assumption for the ex-ante calculations), which will vary for each monitoring period, based on the actual data obtained at the time of distribution.
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Data / Parameter	$\eta_{new,i,j}$																												
Data unit	Fraction																												
Description	Efficiency of the device of each type i and batch j																												
Source of data	Calculated as per the equation 5 of the applied methodology																												
Description of measurement methods and procedures applied	Efficiency of the improved cookstoves will be estimated each year using equation (5) above where loss in efficiency per year is calculated, and therefore no direct measurement is involved.																												
Frequency of monitoring/recording	Annually																												
Value applied:	Kuniokoa ICS efficiency value for the crediting period years: <table><tr><th rowspan="2">Crediting Period Year</th><th colspan="2">Dura Efficiency value</th></tr><tr><th>With pot skirt</th><th>Without pot skirt</th></tr><tr><td>Year-1</td><td>0.4221</td><td>0.3845</td></tr><tr><td>Year-2</td><td>0.4178</td><td>0.3806</td></tr><tr><td>Year-3</td><td>0.4137</td><td>0.3768</td></tr><tr><td>Year-4</td><td>0.4095</td><td>0.3730</td></tr><tr><td>Year-5</td><td>0.4054</td><td>0.3693</td></tr><tr><td>Year-6</td><td>0.4014</td><td>0.3656</td></tr><tr><td>Year-7</td><td>0.3974</td><td>0.3620</td></tr></table> <table><tr><td></td><td>Kuniokoa Efficiency value</td></tr></table>	Crediting Period Year	Dura Efficiency value		With pot skirt	Without pot skirt	Year-1	0.4221	0.3845	Year-2	0.4178	0.3806	Year-3	0.4137	0.3768	Year-4	0.4095	0.3730	Year-5	0.4054	0.3693	Year-6	0.4014	0.3656	Year-7	0.3974	0.3620		Kuniokoa Efficiency value
Crediting Period Year	Dura Efficiency value																												
	With pot skirt	Without pot skirt																											
Year-1	0.4221	0.3845																											
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Year-3	0.4137	0.3768																											
Year-4	0.4095	0.3730																											
Year-5	0.4054	0.3693																											
Year-6	0.4014	0.3656																											
Year-7	0.3974	0.3620																											
	Kuniokoa Efficiency value																												

	Crediting Period Year	With pot skirt	Without pot skirt
	Year-1	0.4794	0.4124
	Year-2	0.4746	0.4083
	Year-3	0.4699	0.4042
	Year-4	0.4652	0.4001
	Year-5	0.4605	0.3961
	Year-6	0.4559	0.3922
	Year-7	0.4513	0.3882
Monitoring equipment	N/A		
QA/QC procedures applied	The values that will be applied will be based on the model of ICS distributed.		
Purpose of data	Calculation of emission reductions		
Calculation method	As per equation (6) above		
Comments	Different models of ICS may be used at the time of distribution (hence monitoring), as indicated in Section 1.11 of PD&MR. Also, the batch j is not segregated in a PAI. Every distribution under a PAI may be considered as a separate batch.		

Data / Parameter	μ_y
Data unit	Fraction
Description	Adjustment to account for any continued use of pre-project devices during the year y
Source of data	Monitoring
Description of measurement methods and procedures applied	If both the improved cookstove and baseline cookstoves are used together, then surveys shall be conducted to record the average continued operation of baseline cookstoves in a sample of households. The surveys should be designed to capture the cooking habits and stove usage of households in the region,

	including quantification of use of baseline cookstoves, by formulating questions and/or collecting evidences to determine the frequency of usage of both the improved cookstoves and baseline cookstoves. For example, if there were 3 baseline cookstoves in a household and it was determined during the survey that use of one of them continues during the crediting period then a conservative adjustment factor of 0.33 is applied to Bold. Another example would be the case where there was only one baseline cookstove per household and its use during the project period continues along with the improved cookstove to meet 25% of the cooking needs of the household in which case the adjustment factor will be 0.25.
Frequency of monitoring/recording	At least once every two years
Value applied:	0.90³¹ for Kuniokoa Stove 0.75 for Dura stove
Monitoring equipment	N/A
QA/QC procedures applied	N/A
Purpose of data	Calculation of emission reductions
Calculation method	N/A
Comments	N/A

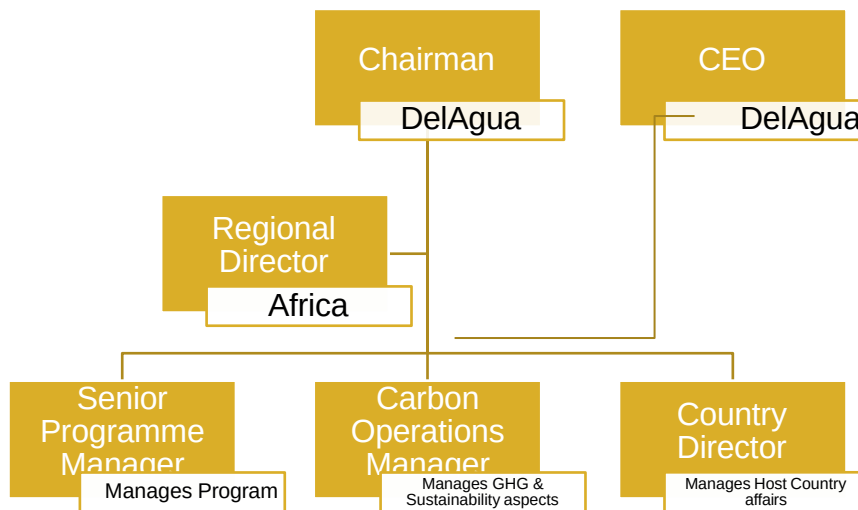
6.3 Monitoring Plan

The VCS Grouped Project in Rwanda will be following 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.

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

³¹ Applied as assumption for year-1 estimations. Post that, an assumed linear degradation of 2% is considered for the ER estimations.

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

1. Monitoring Plan Design for the Grouped Project Activity:

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.

1. Responsibility

The main roles and responsibilities of the parties involved is as described below:

DelAgua

- Acts as the project managing entity
- Development of PDD
- 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.

2. Quality Assurance and Quality Control

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 and /or lamps 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:

1. Surveys are conducted by staff trained by DelAgua.
2. Supervisors are separately trained by DelAgua to spot-check surveyor results.
3. 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.
4. 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.
5. 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.

3. Training and maintenance procedures:

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.

4. 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.

5. Sampling Plan:

The sampling plan is intended to enable the discovery of unbiased and reliable estimates of monitored parameter values used in the GHG emission reduction calculations. The sampling plan design is based on the CDM Guideline: Sampling and surveys for CDM project activities and programmes of activities, version 4.

6. Sampling Design:

a. Objectives & Reliability Requirements

Sampling activities are defined at the Grouped Project-level and the sampling plan presented here will apply to assess parameter values in PAIs to be included in the GP, either individually or in groups.

Samples will be calculated on a 90/10 confidence/precision for individual PAIs on an annual basis, or 95/10 confidence/precision basis for groups of PAIs or sampling on a biennial basis. This is in accordance with the Para 11 of the CDM Sampling Standard, ver. 09.0.

In cases where the confidence/precision are not achieved, the lower/upper bound (whichever leads to conservative ER value) of the confidence interval of the parameter value may be chosen as an alternative to repeating the survey efforts.

Parameter values may be estimated by applying a sampling in accordance with the latest version of the CDM Sampling Standard for a single PAI or a group of PAIs. A single sampling plan covering a group of PAIs is justified when either the homogeneity of included PAIs relative to the

parameters of interest can be demonstrated or the differences among the included PAIs is taken into account in the sample size calculation.

b. Target Population

The target population is the combined unique entries of ICS users by PAI in the monitoring database from which the sample is being drawn.

c. Sampling Method

For each survey, the sampling method is determined by using a random sample of the total population of distributed ICS from records generated in the monitoring database and based on the precision requirements listed above, and as required by the methodology and guidance in the CDM Sampling Standard.

Cross-PAI sampling may be carried out. In such cases, 95/10 confidence/precision will be applied.

d. Sample Size

The sample size for each monitoring activity will be the total number of ICS distributed and included in the monitoring database. A sample size calculation sheet will be used to calculate the number of samples.

Oversampling will be conducted to ensure that the required level of precision is met.

To estimate the sample size for parameters $N_{y,i,j}$ and $\mu_{y,i,j}$ the following equation is used:

$$n \geq \frac{1.96^2 N \times p (1-p)}{(N -1) \times 0.1^2 \times p^2 + 1.96^2 \times p (1-p)}$$

Where:

n = Sample size

N = Population size (Total number of households/ICS)

p = Expected proportion

1.96 = Represents the 95% confidence required

(In the case of 90% confidence, 1.645 shall be used)

0.1 = Represents the 10% relative precision

The following assumptions are made to exemplify the sample size calculation for parameters: $N_{y,i,j}$ and $\mu_{y,i,j}$.

The ICS distributed considered under current monitoring period are 195,227 ICSs. Hence, population size, N , is taken as 195,227 households/ICS.

It is expected at least 90% of ICS will be operational as during last survey the operational rate was more than 99%, hence the expected proportion p for $N_{y,ij}$ is taken as 0.9.

Sample size calculation:

The calculation of the required sample size for each parameter in the first monitoring period is illustrated below for a 95/10 level of confidence and precision (for biennial monitoring periods the sample sizes will be recalculated using 95/5 confidence/precision values). In all cases a conservative approach is taken, however if for any parameter the required 95/10 confidence/precision is not met then the project proponent will randomly select an additional sample and collect further data from this sample to ensure the pooled data meet or exceed the required thresholds.

Parameter $N_{y,ij}$: Based on the above assumptions, the resulting sampling size for a 95/10 confidence/precision is calculated as:

$$n \geq \frac{1.96^2 \times 195,227 \times 0.9 (1-0.9)}{(195,227-1) \times 0.1^2 \times 0.9^2 + 1.96^2 \times 0.9 (1-0.9)}$$

Which comes out to be

$$n \geq 42.68$$

$$n = 43$$

Therefore, in this case a sample size of 43 is to be sampled from each primary sampling unit.

In case the resulting sample size to achieve the desired confidence/precision levels is smaller than 30 ICS, a minimum sample size of 30 shall be chosen when the parameter of interest is a proportion in line with para 14 of Standard: Sampling and surveys for CDM project activities and programmes of activities, Version-09. However, the PP decided to select sample as for population size more than 1000 minimum 100 samples and for less than 1000 minimum 30 samples will be selected.

For mean parameter:

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

Where:

V	$= \left(\frac{SD}{mean} \right)^2$
n	= Sample size
N	= Total number of households
<i>Mean</i>	= Our expected mean (3.5 hours)
<i>SD</i>	= Our expected standard deviation (2.5 hours)
1.645	= Represents the 90% confidence required

The PP may choose to use the same samples to monitor more than one parameter, where parameters have same units. Sampling more than one parameter within the same sample (household) helps reduce travel needs for monitoring and the associated costs. At the same time this approach ensures the random selection of samples for every parameter.

Oversampling is strongly encouraged, not only to compensate for any attrition, outliers or non-response associated with the sample, but also to prevent a situation at the analysis stage where the required reliability is not achieved and additional sampling efforts would be required. The sample size shown above will be adjusted upwards to account for non-responses, PP shall determine the appropriate non-responses rate based on previous experience.

e. Sampling Frame

The Sampling Frame will be the monitoring database which may contain information from multiple PAIs and therefore allows for sampling to be applied per PAI or as a group of PAIs.

Sample Survey results current monitoring period:

As per sample size calculated the number of samples comes less than 100, however the actual sample size considered for the during current verification is 157 samples, which is conservative. The sample survey carried out from 28-February-2023 to 04-March-2023. The sampling survey results shows that all the ICS were found operational during current monitoring period. Further, during monitoring survey it was also found that 33.02% baseline stove usage along with project stove, the same has been considered for adjustment in B_{old} for emission reduction calculation. Further, as per monitoring survey pot skirt usage rate found as 53.97%, the same has been used to calculate weighted average of improved cookstove efficiency for emission reduction calculation. The sampling was undertaken by complying the 95/10 confidence precession as survey sample conducted for the project activity. As per survey results the project have achieved the required confidence and precision level as margin of error is less than 1%.

7 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

7.1 Data and Parameters Monitored

Data / Parameter	$N_{y,i,j}$
Data unit	Number
Description	Number of project devices of type i and batch j operating during year y
Value applied:	PAI-2 195,227
Comments	During current monitoring period all the ICS units distributed under PAI-2 are considered for the VCU calculation. The sampling was undertaken by complying the 95/10 confidence precession as survey sample conducted for the project activity. As per survey results the project have achieved the required confidence and precision level. All the ICS units distributed during current monitoring period are considered for the VCU calculation, as the monitoring surveys provide a 100% operational rate.

Data / Parameter	η_{old}
Data unit	Fraction
Description	Efficiency of baseline stove
Value applied:	0.1026
Comments	This value is obtained from the HouseHold (HH) visit forms that are recorded for each HH at the time of distribution. The average of the baseline device efficiency is used to calculate the parameter value.

Data / Parameter	$\eta_{new,i,j}$																
Data unit	Fraction																
Description	Efficiency of the device of each type i and batch j																
Value applied:	<table><tr><th rowspan="2">Crediting Period Year</th><th colspan="2">Dura Efficiency value</th></tr><tr><th>With pot skirt</th><th>Without pot skirt</th></tr><tr><td>2021</td><td>0.4054</td><td>0.3693</td></tr><tr><td>2022</td><td>0.4014</td><td>0.3656</td></tr><tr><td>2023</td><td>0.3974</td><td>0.3620</td></tr></table>			Crediting Period Year	Dura Efficiency value		With pot skirt	Without pot skirt	2021	0.4054	0.3693	2022	0.4014	0.3656	2023	0.3974	0.3620
Crediting Period Year	Dura Efficiency value																
	With pot skirt	Without pot skirt															
2021	0.4054	0.3693															
2022	0.4014	0.3656															
2023	0.3974	0.3620															
Comments	Only Dura stove distributed and operational during current monitoring period under PAI-2.																

Data / Parameter	μ_y
Data unit	Fraction
Description	Adjustment to account for any continued use of pre-project devices during the year y
Value applied:	0.6698
Comments	The sampling was undertaken by complying the 95/10 confidence precession along with $N_{j,y,i}$

Data / Parameter	Date of commissioning of batch j
Data unit	Date
Description	To establish the date of commissioning, the Project Participant may opt to group the devices in “batches” and the latest date of commissioning of a device within the batch shall be used as the date of commissioning for the entire batch.

Value applied:	01-March-2016 (distribution of first ICS)
Comments	The start date of second renewable crediting period is from 15-September-2021.

Data / Parameter	Life span
Data unit	Years
Description	The operating lifetime of the project device. The life span should be reported if the methodology equation 5 is adopted to determine the project stove efficiency
Value applied:	7
Comments	As per manufacturer specification.

7.2 Baseline Emissions

Not applicable. The applied methodology VMR0006 does not have provision to calculate baseline emissions as separate.

7.3 Project Emissions

Not applicable. The applied methodology VMR0006 does not have provision to calculate project emissions as separate.

7.4 Leakage

A net to gross adjustment factor of 0.95 is already part of the methodological equation to calculate the Emission Reductions. The methodology states that there is no requirement to monitor leakage as separate if this net to gross adjustment factor is applied for the ER calculations.

7.5 Net GHG Emission Reductions and Removals

The PAI-2 involves distribution of only one type of ICS i.e. Dura cookstoves and all ICS under project considered for emission reduction calculation from 15th September 2021 to 28th February 2023 (Both days included).

Calculation for year 15-September-2021 to 31-December-2021:

Parameter	Unit	Value	Source
$N_{y,l,j}$	Number	195,227	Distribution database
$NCV_{wood\ fuel}$	TJ/Tonne	0.0156	IPCC default value for wood fuel
f_{NRB}	fraction	0.91	Third party fNRB report in line with TOOL30
$EF_{wf,non\ CO_2}$	tCO ₂ e/TJ	26.23	IPCC default value for wood fuel
EF_{wf,CO_2}	tCO ₂ e/TJ	112	IPCC default value for wood fuel
η_{old}	fraction	0.1026	Values established as per monitoring survey of HHs and distribution records
$\eta_{new,i,j}$	fraction	0.3888	Weighted average calculated in ER sheet
$B_{old_adjusted}$	Tonne/HH/year	2.953	After adjusting baseline stove usage.
$B_{y,savings,i,j}$	Tonne/HH/year	2.174	Calculated
μ_y	fraction	0.6698	As per survey report conducted from 28-Feb-23 to 04-Mar-23

The emission reduction is calculated as below for ICS operational during 15-September-2021 to 31-December-2021 is calculated based on number of days of operation

$$ER_{y,l,j} = B_{y,savings,i,j} \times NCV_{wood\ fuel} \times f_{NRB} \times (EF_{wf,CO_2} + EF_{wf,non\ CO_2}) \times N_{y,l,j} \times 0.95 \times \mu_y$$

$$= 234,105\ tCO_2e\ ER_{y,2021} =$$

$$234,105\ tCO_2e$$

$$ER_{2022} = 788,326\ tCO_2e$$

$$ER_{2023} = 126,960\ tCO_2e$$

The VCU's obtained during M.P.-2 are provided in the table below. The detailed calculations for this may be referred from the ER Sheet.

Year	Baseline emissions or removals (tCO ₂ e)	Project emissions or removals (tCO ₂ e)	Leakage emissions (tCO ₂ e)	Net GHG emission reductions or removals (tCO ₂ e)
15-September-2021-31-December-2021	234,105	-	-	234,105

01-January-2022 – 31-December-2022	788,326	-	-	788,326
01-January-2023– 28-February-2023	126,960			126,960
Total	1,149,391	-	-	1,149,3911

<u>Ex-ante emissions reductions /removals</u>	<u>Achieved emissions reductions/ removals</u>	<u>Percent difference</u>	<u>Justification for the difference</u>
261,409	234,105	-10.44%	The actual emission reduction achieved during current monitoring period are lower than the ex-ante estimations as the ex-post monitoring survey results were different than the estimations. .
880,356	788,326	-10.45%	
140,364	126,960	-9.55%	

APPENDIX X: FNRB CALCULATION

Step 1: Estimation of renewable biomass (RB) in the country of Rwanda as per equation (4) of the fNRB tool

$$RB = \sum (MAI_{forest,i} \times (F_{forest,i} - P_{forest,i})) + \sum (MAI_{other,i} \times (F_{other,i} - P_{other,i})) \quad \text{Equation (4)}$$

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
Forest	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 ³² spatial data for 2000 and 2021, which is derived from Hansen et al. ³³ , and disaggregated according to the FAO ³⁴ global ecological zones. The total woody cover extent, including forests and other wooded areas, was calculated for each ecological
Extent of forest and other wooded land in 2021	(in ha)	
Protected Areas	(in ha)	
Protected areas within forest areas	137,289	
Remote areas within forest areas	12,681	

³² 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.

³³ Hansen, M. C. C. et al. High-resolution global maps of 21st-century forest cover change. Science (80-). 342, 850–854 (2013)

³⁴ 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>.

		zone, within the protected areas and within areas that are either accessible or geographically remote.
Mean Annual Increment (MAI)	In (t/ha/year)	
Tropical Mountain System	1.82	The mean annual increment for forest is calculated as default age weighted average of the forest type and as per IPCC ³⁵ values for Tropical Mountain system.
Wood density	0.725 t/m ³	FAO ¹¹

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. Jumbe and Angelsen³⁶ 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.³⁷ 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)
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³⁵ 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)

³⁶ Jumbe, C. B. L. & Angelsen, A. Modeling choice of fuelwood source among rural households in Malawi: A multinomial probit analysis. Energy Econ. 33, 732–738 (2011).

³⁷ Bandyopadhyay, S., Shyamsundar, P. & Baccini, A. Forests, biomass use and poverty in Malawi. Ecol. Econ. 70, 2461–2471 (2011)

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 fNRB tool

$$NRB = H - RB$$

Where,

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

$$H = HW \times N + CE + NE$$

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 statistics³⁸ and consumption data sourced from literature^{39,40}, the FAO⁴¹ 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 making⁴² 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

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

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

40 FAO. Forestry Sector in 2020: <https://www.fao.org/forest-resources-assessment/fra-2020/country-reports/en/>.

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

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

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 fNRB. 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
H (in t/year)	6,177,233	The world bank 2022
HW woody biomass consumption in households (in t/year)	3,811,484	Calculated
CE Non domestic woody biomass consumption for energy application (in t/year)	201,877	Calculated, using biomass expansion factor 1.50 ⁴³
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

Equation (3) of the fNRB 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 fNRB tool.

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

$$\text{NRB} = \text{H} - \text{RB}$$

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.

$$\text{NRB} = 6,177,233 - 578,495$$

$$\text{NRB} = 578,495 \text{ t/year}$$

43 FAO. 2020a

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

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

This step calculates the fraction of woody biomass that can be established as non-renewable (fNRB). 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.

$$fNRB = 578,495 / (6,177,233 + 578,495)$$

$$fNRB = 91.0\%$$

The resulting fNRB value is higher than the expected fNRB values determined in peer reviewed literature⁴⁴ 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 fNRB estimates between the application of the CDM method in the present study and the WISDOM method in the peer reviewed literature⁴⁵:

- More recent population statistics (2021) for Rwanda were used and represents an increase in population numbers since the 2009 data utilised in the comparison study.
- Updated 2019 FAO forest products statistics were used in the present study, whereas the comparison study used 2013 FAO forest products statistics.
- 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 fNRB.
- 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 2006 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 comparison study, 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 fNRB.

The calculated fNRB 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^{46,47,48}.

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

45 Ibid.

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

47 Global Forest Watch (GFW). 2023.

48 Mongabay. 2020.

APPENDIX II: METHODOLOGY DEVIATION APPROVED DURING FIRST CREDITING PERIOD

During the project activity implementation for its first monitoring period, the grouped project activity was undergoing one deviation from the methodological requirements. However, this is only for the implemented part of the project activity, where this deviation has occurred. On the other hand, the proposed grouped project is defined to meet all methodological requirements for the methodology applied, and hence no deviations are being proposed.

Deviation from the methodological requirements:

During the first monitoring period, parameters $N_{y,i}$ & μ_y were required to be monitored once every two years, which is defined in Section 9.2 of the applied methodology. The parameter $\eta_{new,i,y}$ has a monitoring frequency of 1 year, however, it was not required to be monitored since the PP is applying a linear degradation approach⁴⁹ defined in the applied methodology. Since the project activity start date is 01/01/2019, the monitoring surveys were required to be conducted before 31/12/2020. However, due to the outbreak of COVID-19 in 2020⁵⁰, PP was unable to perform the monitoring for the grouped project activity. The monitoring could not be planned in advance, especially in the case when the applied methodology was approved in September 2020.

The alternative approach of conducting the remote monitoring was not applied in this case, since most of the end-users are not equipped with the modern communication equipment such as mobile phones. This led to a delay in the monitoring of the parameters, and came as a deviation from the methodological requirements as well as the monitoring plan defined in the Section 5.3 of the PD&MR. As soon as the COVID-19 restrictions on public movement subsided and a formal decision to move ahead with the approach of registering this VCS GP was taken in 2021, the planning and conducting the monitoring surveys was done in 2021.

Applied measures to attain degree of conservativeness as compared to the monitoring plan scenario:

During the first monitoring period, the deviation from methodological requirements, i.e. delay in the monitoring of parameters, led PP to apply conservative values for the previous years of implementation of the project activity (2019 & 2020), obtained during the first monitoring period surveys conducted in later half of 2021.

Tables below highlight the variation in the values obtained during the monitoring surveys.

⁴⁹ Refer Section 5.2 of this report.

⁵⁰ <https://www.gov.rw/blog-detail/covid-19-cabinet-reviews-lockdown-measures-effective-may-4th-2020#:~:text=Borders%20will%20remain%20closed%2C%20except,and%20mass%20gatherings%20are%20prohibited.>

Parameters obtained during the monitoring:

Monitoring period year	η_{new}	Operational Rate	Usage Rate	Comments
2019	PAI-1 With skirt – 0.4054 Without skirt – 0.3693 PAI-2 With skirt – 0.4137 Without skirt – 0.3768	Unavailable	Unavailable	The monitoring for this year could not be performed due to 1. The VCS Grouped Project was not conceptualized. 2. The lack of funds with the CDM CPA Implementer to operate the program and continue with the monitoring of stoves. The efficiency η_{new} values are following the linear degradation as per the crediting period year within the monitoring period. This is conservative. The parameters operational rate and usage rate this year would've been lower than the previous years of operation, as usage and operational rate can't increase for an activity that only had one batch of distribution, and has no continuous distributions apart from the first distribution batch. The operational rate parameter only covers for the availability of the project ICS at the beneficiary user house, since usage check is the actual parameter that impacts the credit generation by project stoves. This is the actual reason why operational

				rate was higher for the project ICS even in the last years of lifetime.
2020	PAI-1 With skirt – 0.4014 Without skirt – 0.3656 PAI-2 With skirt – 0.4095 Without skirt – 0.3730	Unavailable	Unavailable	The monitoring for this year could not be performed due to 1. The VCS Grouped Project was not conceptualized. 2. The lack of funds with the CDM CPA Implementer to operate the program and continue with the monitoring of stoves. The parameters operational rate and usage rate this year would've been lower than the previous years of operation, as usage and operational rate can't increase for an activity that only had one batch of distribution, and has no continuous distributions apart from the first distribution batch. The operational rate parameter only covers for the availability of the project ICS at the beneficiary user house, since usage check is the actual parameter that impacts the credit generation by project stoves. This is the actual reason why operational rate was higher for the project ICS even in the last years of lifetime.
2021	PAI-1 With skirt – 0.3974	PAI-1 98.51%	PAI-1 51.1%	The monitoring was performed this year when concept of CDM CPAs moving to the VCS under

	Without skirt – 0.3620	PAI-2 99.04%	PAI-2 51.6%	a grouped project, and agreement on the VCS Project Start Date was confirmed as eligible by the Verra Secretariat. The operational rate for the last year of operation shall be considered as conservative for the previous years of operation in case where there's no new distribution that took place after the 2014 & 2016 distribution batches for PAI-1 & PAI-2 respectively. When the previously monitored values of usage rate of the project ICS units distributed are compared (under CDM PoA 9626), it can be observed that the values show a decreasing trend with the passing usage years. This usage trend doesn't vary because as the stove units keep getting older, the usage gets reduced. Also, there are no new distributions that took place for PAI – 1 & 2 after their first batch in 2014 & 2016 respectively. There is no possibility for any increase in the usage rate of the project ICS units from their previous usage years. The usage rates of 51.1% & 51.6% for PAI-1 & 2 respectively are lower than their previously monitored usage rates of 66.43% &
	PAI-2 With skirt – 0.4054			
	Without skirt – 0.3693			

				85.48% (monitored in 2018 ⁵¹).
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The operational number of project ICS in 2021 would be lower than the years 2019 & 2020. This is because the usage (be it the usage rate or the number of project ICS) of project devices cannot increase in later years. Therefore, the applied values obtained from the monitoring surveys were used for monitoring period years 2019 & 2020.

In the same manner, the usage of pre-project device is going to increase with time, when the project ICS is ageing, and therefore, being used lesser number of times or being abandoned due to the non- usage. The value of parameter obtained in 2021 is considered to be higher than the years 2019 & 2020, mainly because the usage of pre-project device cannot decrease over a period of time. So, conservative values obtained during the 2021 monitoring surveys were applied to the monitoring period years (2019 & 2020) for which monitoring could not be performed.

Also, the applied values were surveyed through a highly representative and reliable process, wherein the sample size was more than 3x the calculated value, and the parameter value obtained was fulfilling the 95/10 confidence/precision requirements.

Given the fact that PP did not anticipate the COVID-19 restrictions coming in place, and preventing the PP to conduct monitoring surveys and baseline KPT, there is not much PP can do to reverse the methodological deviation.

As the project activity is applying all the possible conservative and reliable factors for periods that could not be monitored, PP seeks deviation to be of acceptable level of precision and conservative for the monitoring period.

⁵¹ Refer Page – 19, row – Calculation Method, in the CDM PoA 9626 M.P.-3. URL: <https://cdm.unfccc.int/UserManagement/FileStorage/SR9PFBKZO4X3JTAE01LMIVC76N5GY>

APPENDIX III: VCS GP 2749 TIMELINE

The project start date is the first date that improved cookstoves first began generating GHG reductions. This project is applying a new VCS methodology, and therefore the project start date is set according to section 3.7.1 of the VCS Standard ver. 4.3.

The ICS under the GP were distributed in 2014 (PAI – 1) & 2016 (PAI – 2).

The important dates related to the project timeline are provided below.

- i) 07/09/2014 – Distribution of first batch of PAI-1 (Group 1) ICS took place
- ii) 15/09/2014 – The Start Date of 15/09/2014 has been accepted by CDM for the PoA 9626⁵²
- iii) 15/01/2016 – Distribution of first batch of PAI-2 (Group 2) ICS took place
- iv) 31/12/2018 – Last date of issuance of credits for ICS units distributed under the CDM PoA
- v) 01/01/2019 – The rights for the GHG emission reduction units generated by the ICS distributed under the CDM PoA 9626 CPAs (01 to 16) are sold to a different entity DHRV Limited, that does not have any communication rights or relations with the CDM PoA
- vi) 01/01/2019 – The VCS Grouped Project 2749 starts crediting, with the first date of operation of ICS under DHRV Limited
- vii) 24/11/2021 – The VCS Grouped Project Joint PD & MR document was uploaded on VCS web for publication by PP DHRV Limited
- viii) 17/03/2022 – The VCS Grouped Project published on registry for public comment for a period of 30 days
- ix) 21/04/2022 – VCS informed PP that the public comment period for VCS Grouped Project 2749 is over and no comments were received during this period

⁵² Please refer CDM PoA Validation Report
(<https://cdm.unfccc.int/UserManagement/FileStorage/JOI7FGKL8YTAWVMCQH31D40URSPN2B>) on Start Date - Page-15, 2nd Sentence.

APPENDIX IV: INFORMATION ON CDM POA 9626 RELATIONS WITH PAI-1 & PAI-2

In the GP, ICS under PAI-1 & PAI-2 were distributed in 2014 & 2016 respectively under the CDM PoA 9626 CPA-1 to CPA-16. The GHG Emission rights belonging to those ICS are transferred by the CDM PoA CME to DelAgua (DelAgua Health Rwanda Voluntary Limited), from the effective date 01-Jan-2019. The main reason for CME transferring the GHG emission rights was its inability to operate the CPAs owing to the lack of funds and interest among the financing entities. Since DelAgua was able to operate the same under VCS, it moved forward with this approach post-consultation with VCS.

Also, it is to be noted that the PP (DelAgua) has no mandate or legal capacity to influence the CDM PoA 9626, for the procedures laid in any or all of its CPAs. The CDM PoA 9626 CPAs 1-16 will not undergo any issuance from 01/01/2019 or later. However, CPAs 18-32 will continue to issue credits under the CDM, as the ICS units are different from those distributed under the CPAs 1-16. The CPA implementers for the CPA 18-32 are also different from those for CPA 1-16, and are not related to the PP (DelAgua). Therefore, it can be ascertained that the ICS units seeking VCUs under the VCS Grouped Project Activity 2749 PAI-1 & PAI-2 no longer belong to CDM, effective from 01/01/2019.

In this context, a declaration signed by the PP (DelAgua) will be shared with the VVB, stating that it has no rights to communicate with CDM under any capacity, as far as CDM PoA 9626 verifications pertaining to CPA-1 to 16 (from 01/01/2019) are concerned.

Adding to the above, the list of CDM PoA 9626 CPAs that are discontinued from CDM is provided below. The evidence for discontinuation is the Voluntary Exclusion of CPAs from CDM PoA 9626, which is shared with the VVB.

S. No.	CPA reference number	CPA specific Issuance details	Evidence of discontinuation available (Yes/No)
1.	9626-P1-0001-CP1	Issuance 1: 9626-MP1-IRP1 (15/09/2014 – 31/03/2015); Issuance 2: 9626-MP2-IRP1 (01/04/2015 – 14/09/2015); Issuance 3: 9626-MP3-IRP1 (15/09/2015 – 31/12/2018)	Yes
2.	9626-P1-0002-CP1	Issuance 1: 9626-MP1-IRP1 (15/09/2014 – 31/03/2015); Issuance 2: 9626-MP2-IRP1 (01/04/2015 – 14/09/2015); Issuance 3: 9626-MP3-IRP1 (15/09/2015 – 31/12/2018)	Yes
3.	9626-P1-0003-CP1	Issuance 1: 9626-MP1-IRP1 (15/09/2014 – 31/03/2015); Issuance 2: 9626-MP2-IRP1	Yes

		(01/04/2015 - 14/09/2015); Issuance 3: 9626-MP3-IRP1 (15/09/2015 - 31/12/2018)	
4.	9626-P1-0004-CP1	Issuance 1: 9626-MP1-IRP1 (15/09/2014 - 31/03/2015); Issuance 2: 9626-MP2-IRP1 (01/04/2015 - 14/09/2015); Issuance 3: 9626-MP3-IRP1 (15/09/2015 - 31/12/2018)	Yes
5.	9626-P1-0005-CP1	Issuance 1: 9626-MP1-IRP1 (15/09/2014 - 31/03/2015); Issuance 2: 9626-MP2-IRP1 (01/04/2015 - 14/09/2015); Issuance 3: 9626-MP3-IRP1 (15/09/2015 - 31/12/2018)	Yes
6.	9626-P1-0006-CP1	Issuance 1: 9626-MP1-IRP1 (15/09/2014 - 31/03/2015); Issuance 2: 9626-MP2-IRP1 (01/04/2015 - 14/09/2015); Issuance 3: 9626-MP3-IRP1 (15/09/2015 - 31/12/2018)	Yes
7.	9626-P1-0007-CP1	Issuance 1: 9626-MP1-IRP1 (15/09/2014 - 31/03/2015); Issuance 2: 9626-MP2-IRP1 (01/04/2015 - 14/09/2015); Issuance 3: 9626-MP3-IRP1 (15/09/2015 - 31/12/2018)	Yes
8.	9626-P1-0008-CP1	Issuance 3: 9626-MP3-IRP1 (15/09/2015 - 31/12/2018)	Yes
9.	9626-P1-0009-CP1	Issuance 3: 9626-MP3-IRP1 (15/09/2015 - 31/12/2018)	Yes
10.	9626-P1-0010-CP1	Issuance 3: 9626-MP3-IRP1 (15/09/2015 - 31/12/2018)	Yes
11.	9626-P1-0011-CP1	Issuance 3: 9626-MP3-IRP1 (15/09/2015 - 31/12/2018)	Yes
12.	9626-P1-0012-CP1	Issuance 3: 9626-MP3-IRP1 (15/09/2015 - 31/12/2018)	Yes
13.	9626-P1-0013-CP1	Issuance 3: 9626-MP3-IRP1 (15/09/2015 - 31/12/2018)	Yes
14.	9626-P1-0014-CP1	Issuance 3: 9626-MP3-IRP1 (15/09/2015 - 31/12/2018)	Yes
15.	9626-P1-0015-CP1	Issuance 3: 9626-MP3-IRP1 (15/09/2015 - 31/12/2018)	Yes

16.	9626-P1- 0016-CP1	Issuance 3: 9626-MP3-IRP1 (15/09/2015 - 31/12/2018)	Yes
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