



Verified Carbon Standard

BETTER COOKING FOR A BETTER HEALTH IN RUSIZI DISTRICT - RWANDA



Project title	Better cooking for a better health In Rusizi district - Rwanda
Project ID	4585
Crediting period	15-May-2023 to 14-May-2033
Original date of issue	For pipeline listing, 03-August-2023 is the date of submission For registration, 14-February-2025 is the date the project description was completed following the completion of the audit The PD is part of a methodology change request (from VM0006 to VM0050 v1.0).
Most recent date of issue	14-August-2026
Version	v10 <i>The first registered PD before methodology change was v6. Since then, v7 was issued on 14-November-2025 at the beginning of the meth change audit. On 26-February-2026, v8 was issued as part of R2 of the findings. Latest version represent VERRA PRR Rd01 responses.</i>
VCS Standard Version	V4.7

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1 PROJECT DETAILS

1.1 Summary Description of the Project

Kiasi Energies will disseminate fixed Improved Cookstove (ICS) in Rwanda that will drastically increase community access to clean cooking solutions by providing, installing, and maintaining energy efficient and smoke reducing cookstoves.

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

The project aims at distributing 100,000 fixed improved cookstoves 2023/B045 to all eligible households in the district of Rusizi in Western Rwanda over the next 4 years. Households are eligible as long as they don't already have access to gas (or any other improved cooking method) for cooking and, ideally, have a separate kitchen to install the improved cookstove.

Those single-pot cookstoves will be built in-situ into domestic kitchens to replace the current 3-stone fire method. Cookstove insert will be distributed for free and the materials (bricks, clay, ...) needed for construction will be collected by the households themselves. Materials are available locally. When the households are not able to find the materials, it will be financed by Kiasi Energies. To date (April 2025) close to 45 000 ICS have been installed by the team.

The table below shows the expected distribution timeline:

Table 1: Distribution and installation plan

Year	Number of stoves distributed
Year 1 (15-May-2023 to 14-May-2024)	25 000
Year 2 (15-May-2024 to 14-May-2025)	25 000
Year 3 (15-May-2025 to 14-May-2026)	25 000
Year 4 (15-May-2026 to 14-May-2027)	25 000
TOTAL	100 000 cookstoves to be distributed

The primary aim of the project is to reduce the emissions of greenhouse gases incurred by high wood consuming cooking practices. Indeed, in the district of Rusizi, a large part of the population is still cooking with a three-stone fire. Education and training programs may also be included to ensure proper usage of the improved cookstoves, which will lead to better health and environmental outcomes for the community, particularly women and children. By introducing these stoves, the project expects to decrease fuel consumption, save households money and time on wood collection, and enhance indoor air quality.

It also benefits the local population with several other socio-economic matters addressed by the Sustainable Development Goals of the United Nations, such as improved health for the households, gender equality, reduced poverty, and others. Those co-benefits will be described in this document.

Location of the project

The project will take place in Rwanda, Rusizi district. The details of the project's location are provided in Section 1.11.

Explanation of how the project is expected to generate GHG emission reductions or removals

The project to distribute improved cookstoves in Rwanda is expected to generate GHG emission reductions by replacing the traditional 3-stone fire method with improved cookstoves that are more efficient and emit fewer pollutants.



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

Biomass, mainly firewood, is significant in Rwanda, representing 79%¹ of energy consumption. In rural areas, 98% of households depend on firewood, charcoal or other biomass for cooking², but the 3-stone open fire method is inefficient and leads to unsustainable usage of non-renewable biomass. The new fuel-efficient stove can result in annual savings of over 55% per stove per household when used correctly, as calculated in the ER sheet.

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

² Modern Energy Cooking Services (MECS) : Rwanda, eCooking Market Assessment, February 2022.

<https://mecs.org.uk/wp-content/uploads/2022/02/MECS-EnDev-Rwanda-eCooking-Market-Assessment.pdf>

The baseline scenario is the continued use of the baseline technology (3-stone fire) involving placing three stones on the ground and using them to support a cooking pot, with the fire burning in the space between the stones. Non-renewable fuelwood is used by the target population to meet similar thermal energy needs as provided by project cook stoves in absence of project activity.

Additionally, households in the project area, which relied on the traditional 3-stone fire method, spent significant time and money on collecting firewood, which is a labor-intensive and time-consuming task that can limit the ability of women and children to engage in other productive activities.

Overall, prior to the implementation of the project, the predominant method of cooking in the project area was highly inefficient, polluting, and had negative impacts on health, the environment, and livelihoods.



Figure 1: Women cooking with a traditional 3-stones fire

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

The average annual GHG emission reduction from the project is expected to be 159 739 tCO_{2eq} per year on average. Overall, the project will avoid the emission of 1 597 393 tCO_{2eq} over a 10-years crediting period.

1.2 Audit History

Audit type	Period	Program	Validation/verification body name	Number of years
Crediting period	15-May-2023 to 14-May-2033	VCS	-	10 years
Validation audit	February-2024	VCS	EPIC sustainability	1 year
1 st verification	15-May-2023 to 14-May-2025	VCS	Sustaincert	Ongoing
Methodology change from VM0006 to VM0050	November-2025	VCS	Sustaincert	Ongoing

1.3 Sectoral Scope and Project Type

Sectoral scope ³	03 Energy Demand Project
Project activity type	Type II – Energy Efficiency Improvement Project

This project is not part of a grouped project or any program.

1.4 Project Eligibility

1.4.1 General eligibility

The project aims to replace traditional three-stone fire cooking methods with energy-efficient cookstoves, resulting in a reduction in carbon dioxide (CO_2) emissions, which is one of the seven greenhouse gases listed in the Kyoto Protocol. Additionally, the project is supported by the VCS-approved methodology VM0050 v1.0, which is called "Energy efficiency and fuel-switch measures in cookstoves", making it eligible under the VCS Program. The activity included in the project relies on energy efficiency improvements and is therefore not part of the excluded project activities table (2.1) from the VCS Standard v4.7.

Justification for compliance with VCS Program scope and exclusion criteria: the project activity falls within the scope of the VCS Program as it involves the distribution and use of energy-efficient cookstoves, which are not excluded under Table 2.1 of the VCS Standard v4.7. Specifically, the project does not fall under any of the following excluded activities:

- Nuclear power generation projects
- Projects involving the destruction of industrial gases (e.g., HFC-23, N_2O)
- Projects involving the generation of hydroelectric power with a capacity of less than 15 MW
- Projects involving the generation of renewable energy with a capacity of less than 1 MW
- Projects involving the destruction of ozone-depleting substances (ODS)
- Projects involving the generation of energy from waste gases, waste heat, or waste pressure where the energy is used to replace energy from fossil sources
- Projects involving the capture and destruction of methane from coal, oil, and gas operations
- Projects involving avoided deforestation or degradation

³ Projects, activities, or methodologies may be developed under any of the 16 VCS sectoral scopes: <https://verra.org/programs/verified-carbon-standard/vcs-program-details/#sectoral-scopes>

The activity included in the project relies on energy efficiency improvements and is therefore not part of the excluded project activities listed in Table 2.1 of the VCS Standard v4.7.

Compliance with pipeline listing deadline, opening meeting, and validation deadline:

The project was initiated on 15-May-2023 and listed on the VCS Project Database on 28-July-2023 as *under validation*. This ensured compliance with the requirement to initiate the pipeline listing process within two years of the project start date.

An opening meeting with the Validation/Verification Body (VVB) was conducted on January 2024 to discuss the project scope, validation requirements, documentation needs, and compliance with VCS Standard v4.7, Section 5.2.

The validation request was formally submitted to the VCS Program on 23-Feb-2024. The project achieved registration on 20-June-2025, which was completed within the permitted validation timeline, as VCS allows validation to be finalized up to concurrent with the first verification (VCS Standard v4.7, Section 3.8.1).

During the first verification process, which commenced in October 2025 following registration, the Project Proponent implemented a methodology update from VM0006 v1.2 to VM0050 v1.0. This methodology change review has been submitted to VCS in May 2026 and is being processed in accordance with VCS verification procedures for methodology updates.

1.4.2 AFOLU project eligibility

This section is not applicable as this is not an AFOLU project.

1.4.3 Transfer project eligibility

This section is not applicable as this is not a transfer project.

1.5 Project Design

- ☐ Single location or installation
- ☒ Multiple locations or project activity instances (but not a grouped project)
- ☐ Grouped project

This project is not part of a grouped project, it has been designed to include multiple installations of improved cookstoves in the district of Rusizi. If the stove broke, another one would be provided to the household.

Eligibility criteria

Below are listed all the eligibility criteria required for multiple project activity instances. Those requirements are available from section 3.1.1 to 3.1.9 and 3.6.4 to 3.6.9 of the VCS Standard v4.7⁴.

Requirements	Project
Both grouped and non-grouped projects can have multiple project activity instances.	This project falls under Multiple Project Activity Instances (several cookstove installations) and is a non-grouped project.
Inclusion of further project activity instances subsequent to initial validation of a non-grouped project is not permitted (see Sections 3.6.10 – 3.6.17 for information on grouped projects).	This is not a grouped project. Project activity instances (stoves) will be installed in all households of the Rusizi district that wishes to participate in the project.
The baseline determination and additionality demonstration for all project activity instances in a project shall be combined (e.g., multiple wind turbines shall be assessed in combination rather than individually).	Baseline determination and additionality demonstration are combined for all instances.
Where a project includes multiple project activity instances from multiple project activities, the project activity instances from each project activity shall be assessed in accordance with Sections 3.6.1 – 3.6.3	Each instance represents a stove. All instances have the same activity. This section is not applicable.
The project proponent shall include in a singular project all project activity instances within ten kilometers of another instance of the same project activity and with the same project proponent (i.e., instances of the same project activity may not be spread across more than one project if they are within ten kilometers of each other).	All instances are in Rusizi district. All instances are part of the same project.
Where a capacity limit applies to a project activity included in the project, no project activity instance shall exceed such limit. Further, no single cluster of project activity instances shall exceed the capacity limit, determined as follows: 1) Each project activity instance that exceeds one percent of the capacity limit shall be identified. 2) Such instances shall be divided into clusters, whereby	No capacity Limit applies, as per the methodology VM0050 v1.0.

⁴ <https://verra.org/wp-content/uploads/2024/04/VCS-Standard-v4.7-FINAL-4.15.24.pdf>

each cluster is comprised any system of such 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. 3) None of the clusters shall exceed the capacity limit and no further project activity instances shall be added to the project that would cause any of the clusters to exceed the capacity limit.	
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1.5.1 Grouped project design

This section is not applicable as this is not a grouped project.

1.6 Project Proponent

Organization name	Kiasi Energies
Contact person	Guillaume Fouchères (Juliette Cosson)
Title	President (project manager)
Address	102 bis rue de Miromesnil, 75008 Paris
Telephone	+33 6 89 25 71 15
Email	Guillaume.foucheres@canopy-energy.com Juliette.cosson@canopy-energy.com

1.7 Other Entities Involved in the Project

Kiasi Energies is the project proponent of the project. RDIS, whose information is detailed below is the operating partner of the project. This organization, in collaboration with Kiasi, is distributing and constructing stoves locally.

Organization name	Rural Development Inter-diocesan Service (RDIS)
Role in the project	Operating partner

Contact person	Viateur Ntarindwa
Title	Director
Address	P.O.Box 142, Muhanga, Rwanda, Nyamabuye Sector, Gitarama Cell, Muhanga District
Telephone	(+250) 788760910 (WhatsApp Number)
Email	viateur.ntarindwa@rdis.org.rw

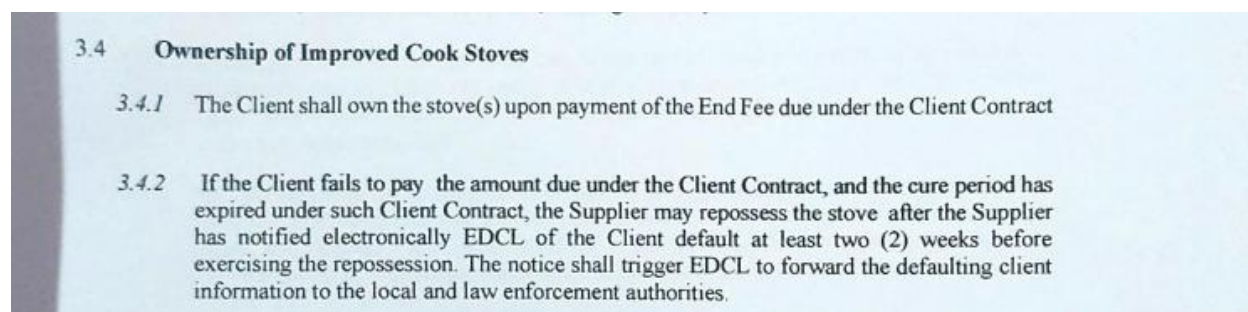
1.8 Ownership

The project is owned by Kiasi Energies.

For Kiasi to prove ownership of the project, we need to wonder who the stoves belong to. As per an agreement signed between EDCL⁵ (Energy Development Corporation Limited) and the operator RDIS, the stoves belong to the beneficiaries as soon the “end fee” is paid (see figure 2 below). In our project, there is no end fee, as the stoves are provided for free. Therefore, we consider the stoves to belong to the beneficiaries as soon as they are installed. As the stoves belong to the households, it also owns the reduction emissions provided by the usage of the stove.

After installation of the stoves, each beneficiary signs a Carbon Transfer Form, transferring the rights over the carbon credits to Kiasi Energies, the Project Proponent (PP), in exchange from the free construction of the stove.

Figure 2: Extract from the contract signed between RDIS and EDCL, detailing the stoves’ ownership



1.9 Project Start Date

In Rwanda, REG (Rwanda Energy Group), EDCL (Energy Development Corporation Limited), and REMA (Rwanda Environment Management Authority) are all interrelated entities working towards the country’s sustainable energy development and environmental management goals. EDCL and REMA (Rwandan DNA) often collaborate on ensuring that energy projects.

<https://www.reg.rw/about-us/subsidiaries/edcl/>

Project start date	15-May-2023
Justification	The start date is the date of actual usage of the first stove distributed. The first stove distributed and installed as part of the project started being used on 15-May-2023, as shown on the date of the signature of the first Carbon Transfer Form.

1.10 Project Crediting Period

Crediting period	☐ Seven years, twice renewable ☒ Ten years, fixed ☐ Other (state the selected crediting period and justify how it conforms with the VCS Program requirements)
Start and end date of first or fixed crediting period	15-May-2023 to 14-May-2033.

1.11 Project Scale and Estimated GHG Emission Reductions or Removals

Project size:

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

Calendar year of crediting period	Estimated GHG emission reductions or removals (tCO ₂ e)
Year 1 (e.g. 15-May-2023 to 14-May-2024)	61 576
Year 2 (e.g. 15-May-2024 to 14-May-2025)	123 152
Year 3 (e.g. 15-May-2025 to 14-May-2026)	184 729
Year 4 (e.g. 15-May-2026 to 14-May-2027)	246 305
Year 5 (e.g. 15-May-2027 to 14-May-2028)	242 884

Year 6 (e.g. 15-May-2028 to 14-May-2029)	239 463
Year 7 (e.g. 15-May-2029 to 14-May-2030)	232 621
Year 8 (e.g. 15-May-2030 to 14-May-2031)	222 359
Year 9 (e.g. 15-May-2031 to 14-May-2032)	164 203
Year 10 (e.g. 15-May-2032 to 14-May-2033)	106 048
Total estimated ERs	1 823 340
Total number of years	10 years
Average annual ERRs	182 334

1.12 Description of the Project Activity

The project activity aims to provide households in the Rusizi District of Rwanda with improved cookstoves to replace the highly inefficient and polluting traditional open fires. The households currently rely on traditional open fires for cooking, which results in high levels of CO_2 emissions, deforestation, and indoor air pollution. To replace the traditional open fires, Kiasi Energy will distribute the Stove, a single pot ceramic stove integrated into a mud hearth within the kitchen. This improved cookstove design reduces heat loss and improves heat transfer and combustion efficiency, resulting in decreased fuel use and CO_2 emissions compared to the traditional open fires. The distribution of fuel-efficient cookstoves will also lessen the amount of harmful smoke and indoor air pollution currently associated with traditional open fires, resulting in a decrease in negative health impacts such as respiratory diseases among rural households. Additionally, by reducing the need to collect firewood, households will have more time for other developmental activities. The project will collaborate with in-country partners to ensure successful implementation.

Beneficiaries will sign a Carbon Transfer Form after reception, installation and commissioning of the stoves. The CTFs will transfer the carbon rights, and thus the carbon credits to be obtained, to Kiasi Energies, the project proponent. The users also guarantee access to a representative of Kiasi Energies to maintain and monitor the condition of the stove.

The stove distribution and installation process is implemented as follows:

- The stove liner is first distributed to the household, who takes it home.
- A trained installer subsequently visits the household to construct and install the stove using bricks, mud, and cement.

- After installation, the household is instructed not to use the stove for approximately one week to allow proper drying and curing of the structure.
- Following this drying period, an enumerator visits the household to verify installation and requests the household to sign the CTF.

This process ensures that sufficient time is allowed for proper drying before stove use.

At the time the CTF is signed, the stove has already been installed and put into operation by the household.

Therefore, the date of CTF signature corresponds to a point when the stove is fully operational and actively used by the household. This has been clarified in several sections of the PD.

Technology/Measure

The 2023/B045 stove, installed by RDIS, is the type of cooking stove that has been designed and developed specifically for use in Rwanda. The stove's liner (Figure 3) is made with locally sourced materials and the stove body is constructed by RDIS in situ using clay and cement. The stove was assigned codes i.e., 2023/B045. Detailed of the stove physical parameters are described in the table below. The stove 2023/B045 is the only model distributed and constructed for the purpose of the project activities. It has a lifespan of 8 to 10 years, according to the manufacturer's specifications. We will consider a lifespan of 8 years for ER calculation purposes⁶.

Table 2: Measurable parameters of the stove

Parameters	Units	Sample 1
Assigned stove Code		2023/B045
Length of the entire stove	Cm	66.0
Height of the stove from the ground	Cm	44.0
Combustion chamber height	Cm	21.0
Combustion chamber (inner) diameter	Cm	15.0
Combustion chamber (Outer Diameter)	Cm	18.0
Height of the door	Cm	8.5
Pot rest height	Cm	1
Thermal Efficiency (initial, then improved)	%	31.2

⁶ Manufacturer's specifications are provided as a supporting document.



Figure 3: RDIS stove before installation (liner)



Figure 4: RDIS stove after installation



Figure 5: Cookstove top Diameter



Figure 6: Cookstove Height from the ground

Stove components

The RDIS improved fixed stove is a type of cooking stove that has been designed and developed by Muhanga Improved Local Technologies company and Best Product Services (BPS) specifically for use in Rwanda. The stove is made from a clay liner and locally sourced materials such as clay and cement. MILT is in the district of Muhanga and is a strategic partner of RDIS (whose headquarters is also based in Muhanga), the operator of the project. MILT and BPS produce clay products and mainly improved cookstoves and water filters⁷.

⁷ <https://www.rdis.org.rw/milt>

The stove was tested using the WBT 4.2.3 protocol by Clean Cooking Alliance⁸, which provides a standard method for evaluating the performance of the cookstove. The protocol measures several parameters, including thermal efficiency, specific fuel consumption, burning rate, and boiling time.

The RDIS-improved cook stove uses a total of six mudbricks that will be made by households as their in-kind contribution. The average size of the brick would be 25cm x 11cm x 8cm. During the installation process, the bricks are joined together using a mixture of mudbricks, cement, cow dung, grounded stones, and water. Insulation is settled around the stove to increase the stove's thermal efficiency, ensuring a reduction in heat loss. The stove has a top that allows the pot to sit higher, improving the flow of air into the combustion chamber and out through the top of the stove. It also has three valves at its upper part that support the pan or pot and, more importantly, permit the air to flow inside the stove while feeding the fuel into the combustion chamber, resulting in complete combustion of wood.

As per the water boiling test's results by the Centre for Research in Energy and Energy Conservation (CREEC), an ISO certified laboratory based in Makerere University, its thermal efficiency is 31.2% (initially). Since then, the construction method was improved with the CREEC and the stove manufacturer. The wood fuel savings will be calculated from baseline and project stoves KPTs.

Year	Number of stoves distributed
Year 1 (15-May-2023 to 14-May-2024)	25 000
Year 2 (15-May-2024 to 14-May-2025)	25 000
Year 3 (15-May-2025 to 14-May-2026)	25 000
Year 4 (15-May-2026 to 14-May-2027)	25 000
TOTAL	100 000 cookstoves to be distributed

The locally made stove is a sustainable and cost-effective choice for households and communities in Rwanda. Its use of locally sourced and low-cost materials supports local industries and economies, while its efficient and reliable performance can help to reduce fuel costs and improve the quality of life for users. Its simple and easy-to-maintain design ensures that it can be easily repaired and maintained locally, minimizing the need for expensive replacements or repairs. If a stove were to break before the end of the crediting period, it would be replaced.

Distribution Plan

As stated in the introduction section, the project aims to cover the whole district of Rusizi. Each village and cell of the district will be visited during the first 4 years of the project. Every HHs that does not have access to a clean cooking solution will be offered the opportunity to participate in the project activities.

⁸ <https://cleancooking.org/binary-data/DOCUMENT/file/000/000/399-1.pdf>

The project aims to distribute 100 000 improved cookstoves within the district of Rusizi. The number of HHs in the district is slightly above 100 000 HHs. The distribution schedule is as follows:

Our local team distributes and installs approximately 2100 stoves per month. The exact number of stoves distributed per month can be extracted at any point from the distribution record. The RDIS' team visits the targeted cells or villages to evaluate the interest of the inhabitants. After storing the appropriate number of stoves in the cell/village offices, the liners are distributed to participants, and the installers then visit HHs to help them install the stoves with the appropriate materials. After a few months, the local team will re-visit each cell or village to ensure every HHs that wished to participate was covered, and that all installed stoves are still used and in good shape. Households that were hesitant during the first visit are usually convinced by their participating neighbors and decide to join the project during the follow up visit. Kiasi and RDIS have exclusive operations in 13 of the 18 sectors of Rusizi district⁹. These 13 sectors will be dealt with in priority, although overall, all sectors are covered at the same time.

Distribution Record

A comprehensive Distribution Record will be stored electronically. The information will be collected by means of a Carbon Transfer Form (CTF) which will be signed by the stove user, stating that the rights to the carbon credits generated by the improved stove will lie with Kiasi Energies.

The following data will be collected:

- Name, Address, and telephone number of all stove end users
- The date of installation
- The sector and cell location of the stove beneficiaries
- Unique Stove ID
- Whether the stove will be used for commercial or domestic purposes
- GPS coordinates of the HH

The central database will serve as a project database for project monitoring and sampling purposes.

Repair, maintenance and replacement plan

During installation of the stoves, the HHs are taught how to carry small repairs with clay and water by themselves. They can then repair small holes or weaknesses on their own.

⁹ The district of Rusizi counts 18 sectors, 89 cells, and 595 villages, all of which will be offered the opportunity to participate.

<https://africaahead.org/countries/rwanda/rwanda-rusizi-district/#:~:text=Rusizi%20District%20is%20one%20of,89%20cells%20and%20595%20villages.>

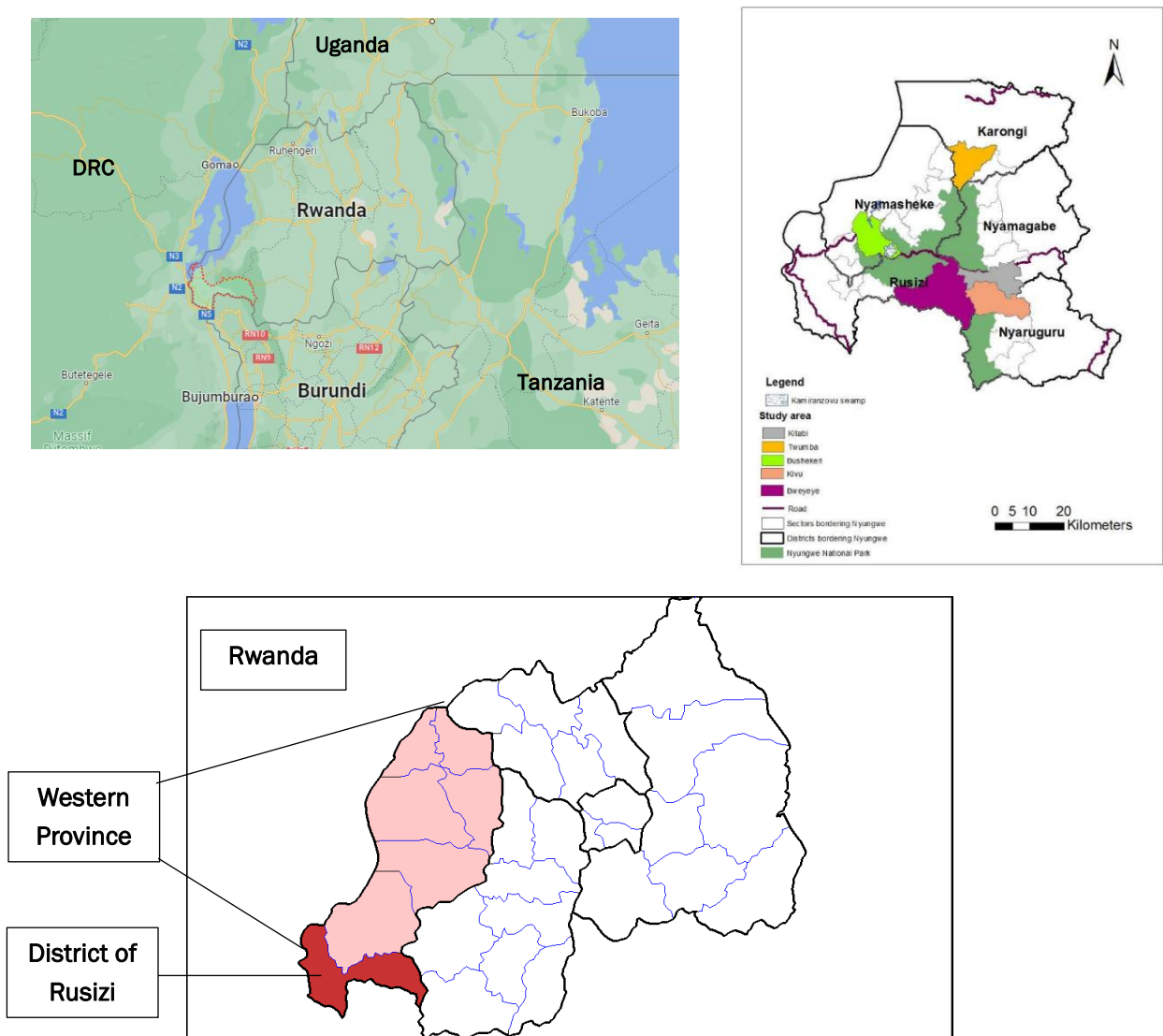
All beneficiaries are given a phone number to call in case of a problem with the stove or to provide their opinion. In case of a more important breakage, the beneficiaries are told to reach out to the team, who would then come to the households to help with the reparation or to replace the stove if the breakage is too important to be repaired. Once again, this replacement is free of charge for the beneficiaries.

All stoves are meant to be replaced when they break and are not repairable.

1.13 Project Location

The project aims to distribute improved cookstoves in Rusizi District, circled in red on the map below. The Rusizi district is located in the Western Province of Rwanda.

Figures 7: Location of the project



Rusizi is a district located in the Western Province of Rwanda. The district is located at GPS coordinates 2.4750° S, 28.8414° E. It is bordered by the Democratic Republic of Congo to the west, the district of Nyamasheke to the north, the district of Kamonyi to the east, and the district of Nyaruguru to the south. Rusizi is in the Great Lakes region of Africa, and its landscape is characterized by hills, valleys, and forests. Rusizi is also home to the Kamembe International Airport, which serves the region and provides an important link to other parts of Rwanda and neighboring countries.

1.14 Conditions Prior to Project Initiation

Before the implementation of the project, most of the households¹⁰ of the Rusizi district cook with traditional open fire. Those “3 stones fires”, as they are called, are very consuming in terms of firewood, and thus they emit large amount of greenhouse gases. They also generate smokes in the kitchen of the households, which causes various respiratory diseases or eye problems, especially for kids and women. The large quantity of wood needed requires a lot of time to collect and is sometimes a financial pit for the households.

1.15 Compliance with Laws, Statutes and Other Regulatory Frameworks

The Project Activity does not violate any of the Host Country’s relevant local, regional, and national laws, statutes, and regulatory frameworks. There are no laws and regulations governing the use of improved cookstoves in Rwanda for households. The project is a voluntary effort by the project proponent.

The following relevant documents have been reviewed:

- Rwanda’s Energy Sector Strategy Plan¹¹ : clean cooking and woodfuel usage is addressed all along the document. As stated in p.63, most of the investment is expected to come from private sector.
- Rwanda Energy Policy¹² (1.3.3, p16 “5) Promoting private sector participation”, p23 “2.8 BIOMASS ENERGY”, but overall, the whole document is relevant)
- Rwanda’s Biomass Energy Strategy¹³, whole document.
- 7-Years Government Programme: National Strategy for Transformation (NST1) 2017 – 2024

¹⁰ There are always some households using gas or other improved technologies. The HH are eligible to be part of the project only if they don’t already have access to improved cooking methods.

¹¹ https://www.reg.rw/fileadmin/user_upload/Final_ESSP.pdf

¹² https://www.reg.rw/fileadmin/user_upload/Rwanda_energy_policy-21612.pdf

¹³ <https://cleancooking.org/wp-content/uploads/2021/07/35-1.pdf>

1.16 Double Counting and Participation under Other GHG Programs

1.16.1 No Double Issuance

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

☐ Yes ☒ No

1.16.2 Registration in Other GHG Programs

Has the project registered under any other GHG programs?

☐ Yes ☒ No

Is the project active under the other program?

☐ Yes ☒ No

1.16.3 Projects Rejected by Other GHG Programs

Has the project been rejected by any other GHG programs?

☐ Yes ☒ No

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

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

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

☒ Yes ☐ No

No emission reductions have been traded so far. However, Kiasi has signed a Letter of Approval with the government of Rwanda to ensure compliance of the credits with the CORSIA requirements. If the credits are used for any other purposes than for mitigation outcomes, the government of Rwanda will discount them from its own NDCs. The process to obtain the appropriate authorization from the government of Rwanda is provided in Appendix 4. By the end of the methodology change, he project has received a letter of approval, as per stated in step 2 of the described process.

1.17.2 No Double Claiming with Other Forms of Environmental Credit

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

☐ Yes☒ No

1.17.3 Supply Chain (Scope 3) Emissions

Do the project activities specified in Section 1.12 affect the emissions footprint of any product(s) (goods or services) that are part of a supply chain?

☐ Yes☒ No

On 11-November-2023, a letter was signed between the stove manufacturer (BPS – Best Products and Services) and the project proponent (Kiasi Energies), to ensure he was aware and agreed that the GHG emission reductions associated with the project stoves belong to Kiasi Energies, as per say on the CTFs signed by the Households. The manufacturer won't claim these ER.

1.18 Sustainable Development Contributions

This project has the potential to make significant sustainable development contributions environmentally, socially, and economically. Improved cookstove projects contribute to sustainable development by promoting the use of cleaner, more efficient cooking technologies, supporting sustainable forest management practices, and creating employment opportunities for local communities. The stoves used in these projects are made from locally available materials, such as clay or metal, and are affordable for most households in the target communities. By doing so, these projects can improve health outcomes, reduce pressure on the forests, mitigate greenhouse gas emissions, and enhance economic development in the target communities.

The Project is expected to contribute positively to the following Sustainable Development Goals (SDGs).

SDG 1: No poverty

This project aims to distribute the stoves for free to try and equip populations who would not have the resources to buy the technology themselves. The stoves are fully financed and should reduce the amount of money needed by HH to buy fuelwood.

SDG 3: Good Health and Well-being

By reducing smoke emissions from traditional stoves, the project can improve the health outcomes of those who use them, particularly women and children.

SDG 5: Gender equality

Women and Children are particularly vulnerable to health issues due to Households Air Pollution (HAP), as they spend more time cooking. By reducing the HAP, women are less likely to develop conditions such as hitchy eyes or pulmonary deficiency.

They are usually in charge of collecting firewood, another time-consuming task that prevent them from having other activities. By sparing time on fuel collection, they are more likely to have other activities, such as going to schools for young girls.

In addition to this, the stove manufacturer chosen for this project hires a majority of women, to ensure improved gender equality. 60% of its full-time workers are women.

SDG 7: Affordable and Clean Energy

The project promotes the use of cleaner and more efficient cooking technologies that require less fuel, leading to increased energy access and affordability.

SDG 8: Decent Work and Economic Growth

The project creates employment opportunities for local communities through the production and distribution of improved cookstoves.

SDG 12: Responsible Consumption and Production

The project activities promote a more responsible consumption of wood fuel used for cooking in Rusizi district, through the reduction of the amount of wood used and through sensitization.

SDG 13: Climate Action

The project can mitigate greenhouse gas emissions by reducing the use of traditional stoves and reducing the demand for firewood.

Overall, the project's positive impact on health, energy access, economic growth, climate action, and land conservation aligns with several SDGs and contributes to the achievement of the United Nations' sustainable development agenda. Through the SD Vista program, we will have these impacts certified

1.19 Additional Information Relevant to the Project

1.19.1 Leakage Management

Not applicable as the project adopts a net gross adjustment factor of 95% to account for leakage, as proposed by the methodology

1.19.2 Commercially Sensitive Information

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

1.19.3 Further Information

This PD is part of a methodology change. The project was first registered under the methodology VMR0006 v1.2. Due to the ineligibility of the methodology under the CORSIA scheme, the project proponent decided to switch to the new methodology VM0050 v1.0.

2 SAFEGUARDS AND STAKEHOLDER ENGAGEMENT

2.1 Stakeholder Engagement and Consultation

2.1.1 Stakeholder Identification



Figure 8: LSC participants filling in the feedback forms.

Stakeholder Identification

These include local households, women, workers, and community leaders and institution. Below is a description of these key stakeholders' groups:

- Local households – beneficiaries: this group englobes all project participants receiving a stove as part of the project. All local households will be offered the opportunity to be part of the project, making all local households potential beneficiaries.
- Women (and children): women and children are often in charge of cooking and collecting firewood, making them more affected by Household Air Pollution (HAP). Special attention will be shown to this group of beneficiaries.

	- Workers: this includes all employees working on the project, whether from the operator RDIS or the project proponent Kiasi. However, specific attention will be given to the local workers: local project staff, stoves' builders and enumerators. - Institutions and local leaders: community leaders and local institutions play a vital role in the project's implementation and acceptance. Village leaders and district employees are a strong part of the project activities. They guide our field team and work in collaboration with Kiasi and RDIS to ensure positive impact of the projects. Community engagement and awareness on the topics related to the project, and collective explanations about the activities that will be carried out in the villages. REMA, the Rwandan DNA, regularly audits the projects.
Legal or customary tenure/access rights	As part of the project activities, the stoves are built inside the participating households. The stove then belongs to the household itself in exchange from the carbon rights. No other land tenure or resources access considerations are applicable.
Stakeholder diversity and changes over time	Households' representation In Rwanda, the organization of the society is very vertical. Sector leaders, district officials, youth representatives, women representatives, religion representatives from the project area were invited to the LSC. They represent the local populations. Village and cell leaders then provide information to local inhabitants. From this information, village leaders report to our team to coordinate activities within their area for the households that wish to be part of the project. These leaders are themselves inhabitants from the cells or villages.
Expected changes in well-being	Expected change in well-being include: - Health improvements, mainly from reduction of HAP - Reduced time spent collecting firewood or income savings from wood purchase. - Job creations - Gender equality improvements within the households.
Location of stakeholders	The stakeholders are located within Rusizi district, corresponding the project location.

Location of resources	NA – No land tenure or resources access consideration. The project does not alter either.
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2.1.2 Stakeholder Consultation and Ongoing Communication

Date of stakeholder consultation	20-December-2022 from 9 a.m. to 12 p.m
Stakeholder engagement process	The meeting's purpose was to inform stakeholders about the project, gather feedback, and ensure collective participation for its success. During the introduction portion of the meeting, all participants introduced themselves, providing their names and affiliations. This allowed everyone to get to know each other and understand each other's perspectives and interests in the project. It also helped to set the tone for a collaborative and productive discussion. Stakeholders discussed potential risks, benefits, and mitigation measures. Communication and information sharing are vital to prevent grievances. The project emphasizes establishing a structured, trusted grievance mechanism to address community concerns promptly.
Consultation outcome	The meeting ended by a time during which stakeholders were gathered in small discussion groups, trying to come up with possible improvements to project design.
Ongoing communication	Communities Community awareness (local leaders included) is carried on yearly. It keeps the population posted on how the project is moving forward, and it reminds them of the benefits and impacts of the project. During stoves distribution, we work in collaboration with local leaders and district officials. Local leaders are the link between the population and our implementation team. After each monitoring, we host a meeting with the district officials to provide information on how the project is moving forward. Every Tuesday there is a community meeting at village level (where enumerators teach village leaders and HHs about proper stoves usage and impacts). Every year, we are required to report to REMA,

	the Rwandan DNA. Every other stakeholder will be provided with the latest monitoring report on demand in the district office.
Stakeholder input	The only remark that came back in several feedback form was the quantity of stoves to be distributed by the project. The initial project design included 50 000 stoves. However, following that consultation, Kiasi decided, along with RDIS, to increase the number of stoves to be distributed to up to 100 000 households, which could cover the whole district of Rusizi.

2.1.3 Free Prior and Informed Consent

Obtaining consent	The CTFs signed by the households represent free, prior and informed consent. Kiasi wishes to adhere to the principles of the FPIC process: • Free: stakeholders were given the freedom to participate or withdraw from the project without facing any negative repercussions. The participation to the project activities is never an obligation. • Prior: our team works in collaboration with village/cell leaders. By warning them and introducing the project, our team informs the leaders and scrute interest from eligible households living in this cell. The stoves are then delivered to the cell office and distributed a few days later. The stoves are installed in the following weeks, and the CTFs are meant to be signed one week after installation, when the stoves start being used. We make sure to grant beneficiaries sufficient time to consider their participation. • Informed: Stakeholders received comprehensive information about the project's impacts, benefits, and risks in a language and format they understand, enabling them to make informed decisions.
Outcome of FPIC	Therefore, the households who sign CTFs are aware of their rights prior to deciding whether they want to participate in the project activities or not. Households are proposed to participate on a voluntary basis. The stoves constructed belong to them.

2.1.4 Grievance Redress Procedure

Development process	To ensure that the feedback and grievance redress procedure is accessible to all project stakeholders, including any interested
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	parties, the project has developed the procedure with the following considerations: - Public awareness campaign: The procedure will be widely publicized through local stakeholders' consultation, local radio broadcasts, and announcements in local newspapers. - Multiple communication channels: Various channels will be provided for submitting feedback and grievances, including a suggestion book at the district office, a dedicated phone line, email, feedback forms, and in-person submissions during community meetings. - Local language and accessibility: All information regarding the procedure will be available in local languages to ensure understanding by all stakeholders.
Grievance redress procedure	By implementing the measures above, the project ensures that the feedback and grievance redress procedure is easily accessible to all stakeholders. This approach fosters an environment of transparency, accountability, and continuous improvement.

2.1.5 Public Comments

During the LSC, 2 questions were raised by the audience. Below are the feedback and questions raised by the stakeholders:

QUESTIONS	ANSWERS
1. How is the reduction of CO ₂ consumption calculated?	1. The RDIS Executive Secretary replied that project partners use technical steps, such as kitchen surveys and water boiling tests, to calculate the reduction of CO ₂ emissions.
2. What contribution beneficiaries can make to generate more CO ₂ and support more carbon projects in Rwanda.	2. Community ownership is key to this project, so training and awareness campaigns will be conducted to help beneficiaries understand that increased usage of the stoves generates more carbon credits. This, in turn, will enable the project developer to implement additional projects.

Two public comments periods were closed:

- The first one happened from 22-August-2023 to 21-September-2023: on VERRA website, as required by the standard.

- A second public comment period happened in Rwanda, to make sure local communities could have a say. An announcement was published in a notorious Rwandan newspaper (igihe.com). The article asking for feedback was published on the 8-August-2023.

Comments received	Actions taken
No feedback was received on either of these 2 channels.	NA

2.2 Risks to Stakeholders and the Environment

2.2.1 Management Experience

The management team brings extensive experience in designing and implementing carbon projects across multiple sectors. Canopy has been developing carbon projects since 2016, including activities in energy efficiency, water, sanitation and hygiene (WASH), and afforestation, reforestation, and revegetation (ARR). This track record demonstrates its ability to manage technically complex projects while ensuring alignment with carbon certification standards.

Within the group, Kiasi Energies, a subsidiary of Canopy, leads on energy efficiency projects. To ensure strong local implementation capacity, Kiasi partnered with the Religious Development Inter-Service (RDIS), which had previously managed and successfully implemented a cookstove project under the Clean Development Mechanism (CDM) in another district of Rwanda. This partnership leverages RDIS's proven community engagement expertise and operational experience in deploying household energy technologies.

In addition, Kiasi has established collaboration with Anchor Eco, a firm specialized in project surveys and monitoring. Anchor Eco complements the RDIS field team by providing technical support in data collection, monitoring, and verification, thereby ensuring high-quality project performance tracking and compliance with international standards.

Where gaps in technical or operational expertise are identified, the proponent has demonstrated the capacity to partner strategically with organizations that bring complementary skills or to recruit locally to strengthen the project team. This approach ensures that all critical functions—from community engagement to monitoring—are covered by experienced professionals.

2.2.2 Risk Assessment

Risks identified	Mitigation or preventative measure(s) taken
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Natural and human-induced risks to stakeholders' wellbeing	No risk identified. All HHs have the choice to take part in the project activities or not.	NA
Natural threats: Climate Variability and Extreme Weather Events	Changes in weather patterns, including extreme events such as floods or droughts, could impact the distribution and construction of improved cookstoves.	- Build resilient supply chains to ensure continuous distribution even during adverse weather: during the rainy season, HHs struggle to find the adequate materials to produce the bricks for them to provide for the stove's installation (drying the mud becomes challenging). During that time, RDIS helps with the bricks production, financed by Kiasi. Photos supporting this statement have been provided to the VVB. - Design and distribute cookstoves that are durable and can withstand extreme weather conditions: our stoves are meant to be installed and fixed inside of a kitchen. In addition to local materials, everything is then fixed with cement.
Human-induced Threats: Non-Adoption or Misuse of Improved Cookstoves	Households may not adopt the new technology or may use it improperly, reducing the anticipated health and environmental benefits.	- Conduct comprehensive training and education programs on the proper use of cookstoves: this happens in 3 different ways: - During the distribution process, first information on impacts and usage is given to HHs. - During the installation, the installers, who came to construct the stove show the HHs how to properly use the stove.

		○ RDIS organizes yearly awareness campaigns, regrouping HH from the all district. All these participants are then asked to teach good practices to other beneficiaries from their villages. A list of awareness campaigns invitees shows RDIS and Kiasi ensure proper geographical representation. All village leaders are also invited to help promote good practices. ● Provide ongoing support and follow-up visits to address any issues or concerns: Enumerators visit HHs randomly on a daily basis. When a problem with the stoves occur, they can plan a specific visit to assist the HH. ● Involve community leaders and influencers to promote the benefits and correct usage of the cookstoves. This happens mainly during the awareness campaigns, where RDIS and during the distribution process, as they help identify HH wishing to participate to project activities.
Human-induced Threats: Economic Barriers	Households may face economic challenges that prevent them from entering the project, such as the inability to provide time for materials gathering for stoves' construction	● Ensure the cookstoves are distributed for free. HH are only asked to collect the necessary materials and construct a few bricks with mud. ● Provide bricks and materials for households who struggle in collecting the materials,

		especially during the rainy season.
Human-induced Threats: Cultural Resistance	Cultural preferences for traditional cooking methods may lead to resistance against adopting improved cookstoves	• Involve local community leaders and respected figures in advocacy efforts, during distribution, to help identify HHs wishing to participate, and during the awareness campaigns, to help promote good practices. • Customize the design of the cookstoves to align with traditional cooking practices as much as possible: this has been validated by the Rwandan Board of Standard, a national entity.
Human-induced Threats: Supply Chain Disruptions	Disruptions in the supply chain could delay the distribution of cookstoves and spare parts, impacting project implementation.	• Maintain a buffer stock of cookstoves to manage short-term disruptions at cell level: the stoves are stored in cells offices before distribution. So are extra bricks for HH in needs. • All stoves are manufactured in Rwanda from a local suppliers. • Set up a monthly visit to supplier to evaluate conformity.
Human-induced Threats: Policy and Regulatory Changes	Changes in government policies or regulations could affect the project's implementation or sustainability.	• Maintain regular communication with relevant government agencies (in our case, mainly REMA, the Rwandan DNA) to stay informed about policy changes. • Aligning the project's objectives with national and regional development plans to ensure policy support.
Human-induced Threats: Monitoring and Evaluation Challenges	Ineffective monitoring and evaluation could lead to difficulties in assessing the project's impact and making necessary adjustments.	• Implement a robust monitoring and evaluation framework with clear indicators and regular data collection.

		Train local staff and partners in monitoring techniques and data management.
Safety of women and girls	No risk identified – The project activities aim to improving their safety conditions (burns, health, ...)	NA
Safety of minority and marginalized groups, including children	No risk identified – The project activities aim to improving their safety conditions (burns, health, ...)	NA
Pollutants (air, noise, discharges to water, generation of waste, and release of hazardous materials and chemical pesticides and fertilizers)	No risk identified. The project will provide fair wages and working conditions that meet or exceed national legal standards.	NA

2.3 Respect for Human Rights and Equity

2.3.1 Labor and Work

	Risks identified ¹⁴	Mitigation or preventative measure(s) taken
Discrimination	No major risks identified. To ensure that no entities involved in the project design and implementation engage in or are complicit in any form of discrimination or sexual harassment, the project will implement strict	- Appropriate disciplinary actions will be taken against individuals found to have engaged in discriminatory or harassing behavior. No such problems have been detected to date. - Encouraging a diverse and inclusive project team by

¹⁴ The identified risks and commensurate mitigation or preventative measure(s) for forced labor, child labor, and human trafficking, must be inclusive of staff and contracted workers employed by third parties.

	measures to promote equality, respect, and inclusivity.	promoting equal opportunities in hiring and advancement, specifically in Rusizi district. All enumerators have been hired locally and trained.
Sexual harassment	No risks identified.	To ensure that no entities involved in the project design and implementation engage in or are complicit in any form of discrimination or sexual harassment, the project will implement strict measures to promote equality, respect, and inclusivity.
Gender equity in labor and work	Kiasi and RDIS are committed to equity during the recruitment processes and between all staff members. Equal pay for equal work is a pillar of this. So is gender equity. Kiasi and RDIS are committed to equity during the recruitment processes and between all staff members. Equal pay for equal work is a pillar of this. So is gender equity.	Training for unskilled positions: for positions that do not require specific skills, the project will provide on-the-job training to local community members. This ensures that even those without prior experience can gain employment and develop new skills. Among the employees of RDIS and of the stoves manufacturer, 2/3 were new staff hired for the project purpose, in Rusizi district. Enumerators have been hired locally and trained (as seen on the training photos provided during the audit). Before each survey, RDIS and Kiasi organize a training for surveyors as well. 5 out of 10 new recruit for the purpose of the project are women, as shown in the supporting document.
Forced labor	Kiasi and RDIS have a tolerance 0 for forced labor,	NA

	child labor and human trafficking. No risk identified.	
Child labor	Kiasi and RDIS have a tolerance 0 for forced labor, child labor and human trafficking. No risk identified.	NA
Human trafficking	Kiasi and RDIS have a tolerance 0 for forced labor, child labor and human trafficking. No risk identified.	NA

2.3.2 Human Rights

Risks identified	Mitigation or preventative measure(s) taken
No risk identified	- No obligation to participate in the project - Free, prior and informed consent from all beneficiaries involved in the project - No negative impacts identified: this project does not require land acquisition, resettlement, or restrictions on resource use – which are major sources of human rights risks.

2.3.3 Indigenous Peoples and Cultural Heritage

Risks identified	Mitigation(s) or preventative measure taken
No risk identified	The stoves were designed to fit local cooking habits, as demonstrated by the evaluation provided by the Rwanda Board of Standard.

2.3.4 Property Rights

Risks identified	Mitigation or preventative measure(s) taken
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No risk identified	The project activities do not include any change in property rights, nor utilization of participants or other stakeholders' property rights. The stoves are provided for beneficiaries. The stove is their property. They cede the carbon rights to Kiasi in exchange for financing the activities.
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2.3.5 Benefit Sharing

Process used to design the benefit sharing plan	The core benefit-sharing agreement is structured around providing the improved cookstove technology and installation at zero monetary cost to the participating households (HHs), while the HHs contribute essential, locally available, non-monetary resources.
Summary of the benefit sharing plan	<u>Project Proponent Obligation (Benefits to HHs):</u> • Free stove liner provision: the project provides the high efficiency cookstove liner completely free of charge. • Free professional installation/construction: the project funds and organizes the skilled labor and necessary materials for the professional installation and construction of the stove around the liner, also at no cost to the HH. • Training: HHs receive free training on the proper use and basic maintenance of the cookstove. • Repairs: HHs are given the team's phone number, to be able to reach out to them in case repairs are needed on their stoves.
Approval and dissemination of benefit sharing plan	Verbal and written consent: or each participating household, informed verbal consent was obtained by the field team upon acceptance of the stove. This verbal consent was supported by a simple Carbon Transfer Form signed by the head of the participating household, explicitly confirming their understanding and acceptance of the zero-cost benefits and the minor contribution of local materials.

2.4 Ecosystem Health

	Risks identified	Mitigation or preventative measure(s) taken
Impacts on biodiversity and ecosystems	No risk identified	Project activities do not impact biodiversity or ecosystems.
Soil degradation and soil erosion	No risk identified	Project activities do not impact soils.
Water consumption and stress	No risk identified	Project activities do not impact water consumption.

2.4.1 Rare, Threatened, and Endangered Species

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

☐ Yes ☒ No

2.4.2 Introduction of Species

NA

2.4.3 Ecosystem Conversion

	Risks identified	Mitigation or preventative measure(s) taken
Ecosystem conversion	No risk identified	NA

3 APPLICATION OF METHODOLOGY

3.1 Title and Reference of Methodology

Type (methodology, tool or module).	Reference ID, if applicable	Title	Version
Methodology	VM0050 v1.0	Energy efficiency and fuel-switch measures in cookstoves	v1.0
TOOL	Water Boiling Test Protocol	Water boiling test	v. 4.2.3

CDM Guidelines	Sampling and surveys	Sampling and surveys of CDM project activities and programmes of activities	v4.0
Standard	CDM standard	Sampling and surveys of CDM project activities and programmes of activities	V9.0
TOOL	TOOL30	Calculation of the Fraction of Non-Renewable Biomass	V4.0
TOOL	TOOL33	Default values for common parameters	V3.0

3.2 Applicability of Methodology

Methodology ID	Applicability condition	Justification of compliance
VM0050 v1.0	This methodology is applicable where all of the following conditions are met: 1) The project activity corresponds to: a) Replacement of non-renewable biomass (e.g., firewood, charcoal)-fired cookstoves with any of the following: i) More efficient project devices that use the same fuel as in the baseline; ii) Efficient project devices fired by renewable biomass or bioethanol; iii) Efficient project devices fired by liquefied petroleum gas (LPG); or VM0050, v1.0 8 iv) Electric-powered project devices. b) Replacement of solid or liquid fossil fuel (e.g., coal, kerosene)-fired cookstoves with any of the following: i) Efficient project devices fired by renewable biomass or	The project involves distribution of domestic woodfuel-efficient cookstoves to households, thus increasing thermal efficiency of cooking devices. The project does not expect fuel switch. (further conditions do not apply)

	bioethanol; ii) Efficient project devices fired by LPG; or iii) Electric-powered project devices	
VM0050 v1.0	Project devices are used in households, communities, institutions, or small or medium enterprises collectively referred to in this methodology as the “target population.	Project devices are used in HHs for domestic purposes.
VM0050 v1.0	Where renewable biomass is used, it is exclusively renewable and qualifies as one of the following: a) A by-product, residue, or waste stream from agriculture, forestry, and related industries; or b) Originating from dedicated plantations that comply with all relevant applicability conditions in the most recent version of CDM TOOL16	NA: no renewable biomass is used.
VM0050 v1.0	Where biomass residues are used, they would have been left to decay or burned without energy recovery before implementation of the project activity, and their use does not involve a decrease in carbon pools – in particular of dead wood, litter, or soil organic carbon – on the land areas from which the biomass residues originate	NA: no biomass residues are used.
VM0050 v1.0	Where biomass residues from a production process are used, project implementation	NA: no biomass residues are used.

	does not result in an increase in the processing capacity of raw input or any other substantial changes (e.g., product change) in this process.	
VM0050 v1.0	Where more than one type of renewable biomass is used, each of the biomass types used complies with the applicability conditions.	NA: no renewable biomass is used.
VM0050 v1.0	Where project activities introduce renewable biomass as charcoal, it is renewable charcoal produced by efficient charcoal production processes ⁶ (e.g., retort sedentary kilns, improved sedentary kilns, Casamance kilns). Methane produced during the charcoaling process is captured and destroyed or combusted for energy purposes	NA: no renewable biomass is used.
VM0050 v1.0	Project devices using renewable biomass (fuel-switch) or non-renewable biomass (improved efficiency) are single-pot, multi-pot portable, or in-situ cookstoves with an initial thermal efficiency ⁸ of at least 25%.	According to the manufacturer's specifications, the stoves of the project: - Are Single pot - Are Fixed (in-situ) cookstoves - Exclusively use woody biomass - Have an initial thermal efficiency of 31.2 % the first year
VM0050 v1.0	Project devices using LPG or bioethanol are single-pot, multi-pot portable, or in-situ cookstoves with an initial thermal efficiency of at least 30%.	NA: project devices do not use LPG or bioethanol.

VM0050 v1.0	Electric project devices meet the maximum risk factor score of 15 on the Cookstove Durability Protocol and have the following minimum thermal efficiency: a) Hot plates and electric hobs: 40% b) Induction stoves and other electric stoves: 70%	NA: the project does not use electric devices.
VM0050 v1.0	Project devices using LPG comply with all of the following conditions: a) The baseline fuel either includes non-renewable biomass or is a more carbon intensive fossil fuel (demonstrated by the baseline survey, see Section 6.2); b) The project has a provision for metering LPG supplied to each consumer at the LPG filling station, in order to determine household LPG consumption; and c) The project does not seek to issue any carbon credits for periods after 31 December 2045.	NA: project devices do not use LPG
VM0050 v1.0	Electric project devices use the following electricity sources: a) Decentralized renewable energy systems: Decentralized energy systems using fossil fuels are not eligible, except for backup generators that supply less than 1% of the annual electricity of the decentralized renewable energy system. ¹² b) Self-generated renewable electricity (with a maximum of 20% electricity from non-	NA: the project does not use electric devices.

	renewable sources for backup); or c) National or regional electricity grid.	
VM0050 v1.0	The project proponent designs incentive mechanisms to reduce the use of inefficient baseline devices and practices that can be replaced by the project devices and describes these mechanisms in the project description.	The distributed stoves are meant to replace baseline 3-stones fires. To do so, the project proponents, offers HHs to participate to the project at no cost. The improved cookstoves are therefore constructed in-situ, where the baseline stoves used to be, to avoid usage of previous stoves.
VM0050 v1.0	Where a project device has ended its technical life, the project proponent either replaces it with a comparable or better project device or retrofits its essential components to continue meeting the minimum service level requirements (i.e., thermal energy generation), otherwise no further emission reductions may be claimed for the project device.	Project device which has ended its technical life or broken stoves are all meant to be replaced by the project team.
VM0050 v1.0	Project proponents implement a method for the distribution and identification of project devices that avoids double counting of emission reductions by other mitigation actions and includes unique product identification on the stove itself at the time of distribution/sale (e.g., program logo, alpha/numeric ID, and end-user location, such as geographic coordinates, complete address information).	Each of the 100 000 improved cookstoves to be distributed will be identified through a unique ID. This ID, engraved on a metallic plate, will be fixed next to the stoves in the beneficiaries' kitchen. A Project database will list the stoves installed, their ID, precise location (coordinates), the beneficiary's name, address, contact and the distribution date. This will ensure that no double-counting occurs, and the project's environmental impact is accurately assessed. Kiasi Energies will ask each beneficiary to sign a Carbon Transfer Form, to ensure that the carbon rights are the property of Kiasi Energies. Furthermore, it has been made clear to the manufacturer that he would not be able to claim to carbon rights. The stoves' manufacturer committed, in a signed letter, not to claim the environmental benefices of the stoves.

VM0050 v1.0	The project complies with any national, sub-national, or local regulations or guidance for the installation, commercialization, distribution, and use of improved cookstoves and/or fuel supply and use for the target population. National, regional, and local regulatory frameworks for the provision of the type of thermal energy services provided by the project activity must be documented.	Project activities were designed in collaboration with the district. Rusizi district is kept informed of design and advancement of activities monthly at the minimum. The project has also been approved by EDCM, confirming Kiasi's fulfilment of all national requirements. Additionally, the project is seeking CORSIA eligibility. Therefore, Kiasi obtained a Letter of Approval from REMA, The Rwandan DNA. As part of their due diligence, REMA visited the project on their own and had positive opinion on the activity.
VM0050 v1.0	Where project activities reduce emissions from non-renewable biomass, including firewood and charcoal, the risk of double counting is assessed on a national basis by evaluating at validation and crediting period renewal whether there are REDD+ projects or jurisdictional REDD+ programs whose project boundary overlaps with the expected fuel source area of the project. The project proponent must report on the findings of this assessment for informational purposes in the project description.	Based on our assessment, the Rusizi District is not currently located within the boundary of any validated or operational REDD+ project or jurisdictional REDD+ program. This finding is crucial as it confirms that the emission reductions from reduced non-renewable biomass consumption achieved by our cookstoves project do not overlap with, and are not double counted against, any existing forest-based carbon scheme. We maintain direct collaboration with REMA, Rwanda's DNA. This oversight, coupled with the National Carbon Market Framework, ensures: - No Double Counting: National tracking prevents simultaneous claims against other projects or Rwanda's NDCs (via Corresponding Adjustments). - Credit Eligibility: Our credits meet the integrity requirements for both the voluntary market and international compliance, including CORSIA.

		Additional information on the process with REMA are given in Appendix 4.
TOOL 30 v4.0 2.2.3 Applicability	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.	We, as project developers, have used this tool to calculate the f_{NRB} for area of the project.
Standard: Sampling and surveys for CDM project activities and programmes of activities Version 09.0	This standard is applicable to CDM project participants, coordinating/managing entities and designated operational entities (DOEs).	Kiasi Energies is a project participant and a managing entity. We will use this standard during surveys sampling.
Standard: Sampling and surveys for CDM project activities and programmes of activities Version 09.0	This document specifies the reliability requirements and describes appropriate sampling methods and what is expected to be provided in a sampling plan. The general requirements shall be applicable to both small-scale and large-scale CDM project activities and PoAs, with any requirements specified in the applied methodologies taking precedence. This document also provides sampling-related requirements pertaining to validation and verification, including the sampling approach to be undertaken by the validating/verifying DOEs. A definition of essential sampling terminology is contained in section 3 below.	This project is large scale. We will provide a sampling plan in the monitoring section.

Though it is not fully related to applicability of the methodology used, VCS issued on 3-February-2025 a document with clarifications and corrections¹⁵ to the VM0050 v1.0. Kiasi Energies has reviewed these clarifications and corrections to ensure application of each of them. The table belows cover these methodological changes.

Methodology ID	Applicability condition	Justification of compliance
Clarification 1 CORRECTION AND CLARIFICATIONS TO VM0050 ENERGY EFFICIENCY AND FUELSWITCH MEASURES IN COOKSTOVES, V1.0	As a cross-check, baseline fuel consumption results must be compared with data from reputable sources, including government publications, peer-reviewed literature, third-party studies, or official data and statistics. The sources must be relevant to the context of the project activity, reflecting baseline cookstove types, types of users, and cooking practices. Where used for cross-checks, these sources must reflect data collected no more than five years ago.	In Section 3.4 about baseline scenario, PP does crosscheck the reference and official data. The document <i>Policy and market review for modern energy cooking in Rwanda</i> (See Footnote 21) is the most reliable one, as it was issued in June 2021, less than 2 years before the project start date, and it backs our assumptions.
Clarification 2 CORRECTION AND CLARIFICATIONS TO VM0050 ENERGY EFFICIENCY AND FUELSWITCH MEASURES IN COOKSTOVES, V1.0	For projects using direct measurement techniques (such as stove use monitors or electricity meters), usage rates are not capped. For projects employing surveys, the usage rate is capped at 90% where all of the following customer support actions are undertaken across the entire target population and demonstrated at verification: 1) Selection of technologies and fuels that fully meet the cooking needs of the target population, demonstrated by citing robust research or conducting an investigation of	Kiasi and RDIS' project falls under the second section, as the stoves are not monitored through direct measurement. The usage rate from the project is therefore capped at 90%. Indeed, the project does satisfy all 3 requirements for this : 1) Fuel: firewood is almost exclusively used for cooking in Rusizi district as presented in section 3.4. In Rusizi district, located in the Eastern Province, 89.3% of the HH are using woodfuel to cook. In this

¹⁵ https://verra.org/wp-content/uploads/2025/02/CC_VM0050_v1.0_Feb2025.pdf

	cooking practices and attitudes 2) Implementation of support activities to assist the target population in effectively operating and maintaining their cookstoves. These may include providing materials (print, in-person, or video) on how to operate the cookstove to prepare common local foods, how to troubleshoot common operational issues, and how to make minor repairs (including obtaining necessary replacement parts). All such communications and materials must be provided in local language(s) commonly used in the project area. 3) Provision of a commonly used, toll-free communications channel through which the target population can contact the project proponent to access support (e.g., maintenance and repair services) For projects employing surveys and that do not implement all of these customer support actions across the entire target population, the usage rate is capped at 75%.	province, Rusizi district is by far the most rural one, bordering DRC and Burundi. In the table previously stated, It is said 92.7% HH located in rural areas in Rwanda use firewood. The proportion of HH using firewood is supposedly even higher. The project is focusing on HH using forewood, and our stoves is designed for this specific usage. Kiasi 's stoves have been approved by the Rwanda Board of Standard as an appropriate solution compared to practices in Rwanda. 2) As part of the project activities, RDIS organises: - In-person visit of the HHs. As we build in house fixed improved cookstoves, the installer comes to the HHs to construct the stove. It then explains how to carry on small repairs if needed and gives them contact information for grievances, which they can reach out to in case of problems with the stove. - Yearly awareness campaigns, which have a dual purpose: re-explaining to HHs of the whole district how to properly use the stoves (amount of firewood to be used,...) and underline the positive impacts of the stoves, both environmental and health-related. Photos of the awareness campaigns are available in Appendix.
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		- A phone number is indeed distributed to HHs at the time of construction of the stoves at their place. Enumerators work in close collaboration with the village leaders, which helps RDIS identify HHs in needs for reparation, even when they do not reach out by themselves. Enumerators also visit HHs on a random basis to ensure the stoves are used and in good conditions. HHs are warned, if they have no phone, for instance, that village leaders are habilitated to pass on messages to RDIS. Therefore, for ER calculation, the usage rates measured will be capped at 90%.
Clarification 3 CORRECTION AND CLARIFICATIONS TO VM0050 ENERGY EFFICIENCY AND FUELSWITCH MEASURES IN COOKSTOVES, V1.0	For usage rate monitoring, the project proponent must collect photographic evidence in the following manner: Take photographs of the stove(s), its components, and the cooking areas. The physical condition of the stove(s) and the cooking areas will help determine stove functionality and use.	During surveys, the stove's of each of the surveyed HHs are photographed. The photos are stored in Kobo Toolbox.
Clarification 4 CORRECTION AND CLARIFICATIONS TO VM0050 ENERGY EFFICIENCY AND FUELSWITCH MEASURES IN COOKSTOVES, V1.0	The project stove efficiency ($\eta_{new,avg,y}$) must be determined using one of the following methods (options 1–3 prescribed in the methodology) and the corresponding documentation must be provided: 1) Water Boiling Test campaigns achieving 90/10 confidence and precision levels as per the most recent version of the CDM Standard for Sampling and Surveys for CDM Project Activities and Programmes of Activities 2) Manufacturer-certified	We are not using the efficiency as part of the calculation of ER. However, the efficiency of the stoves have been tested through different means: - A water boiling test was realized onsite by a University (the CREEC) from Uganda. The 3 different results obtained do respect the 90/10 confidence/precision level, as required by the methodology.

	value that is determined via the Water Boiling Test, with the test results made available for validation by a VVB 3) Certification from the host country's national standards body or certifying agency based on the Water Boiling Test For all three options, cookstove efficiency must be determined based on the Water Boiling Test following the most recent version of the Water Boiling Test Protocol¹ or equivalent national standard/protocol. While carrying out the tests, the low and high power (not simmer) efficiencies must be used to calculate the average thermal efficiency.	- We had the stoves tested by the official national entity in charge: the Rwanda board of Standard. - The manufacturer specifications are provided as supporting document All supporting documents can be shared on demand.
Clarification 5 CORRECTION AND CLARIFICATIONS TO VM0050 ENERGY EFFICIENCY AND FUELSWITCH MEASURES IN COOKSTOVES, V1.0	The following requirements must be applied in addition to the Controlled Cooking Test Protocol, when conducting Controlled Cooking Tests (CCTs): 1) A minimum of 15 CCTs by five different cooks (three repeats per cook) must be conducted per cookstove model. 2) The CCTs must be alternated between the baseline and project cookstoves to limit potential bias caused by increased cook efficiency over repeats. For artisanal cookstoves, at least three randomly selected samples of each cookstove model must be tested.	NA: the project activity does not include any CCT.
Clarification 6 CORRECTION AND CLARIFICATIONS TO VM0050 ENERGY EFFICIENCY AND FUELSWITCH MEASURES IN COOKSTOVES, V1.0	The following values of equivalent standard male adults must be applied when determining the parameters Hhi and Hhj,k (instead of the references provided in Section 9.1 of VM0050, v1.0, parameter table for Hhi and Hhj,k)	As shown in all calculation provided to the VVB as well as in the ex ante calculation, population is accounted with the following factors: - 1 male adult (14-59): 1 - Child under 14: 0.5 - Man over 59 and women: 0.8

		Therefore, the calculation do comply with the clarification.
Clarification 7 CORRECTION AND CLARIFICATIONS TO VM0050 ENERGY EFFICIENCY AND FUELSWITCH MEASURES IN COOKSTOVES, V1.0	For the wood-to-charcoal conversion factor (CF), in addition to government-approved/endorsed national or regional values, the following source of data is accepted for claiming values of up to six tonnes of dry wood input per tonne of charcoal output: • Published, peer-reviewed literature specific to the project region and context	NA: we do not use the wood-to-charcoal conversion factor in any way.
Clarification 8 CORRECTION AND CLARIFICATIONS TO VM0050 ENERGY EFFICIENCY AND FUELSWITCH MEASURES IN COOKSTOVES, V1.0	Footnote 35 must be read as follows: 35 The project proponent may rephrase the question keeping in mind the objective (i.e., whether or not the project cookstove is in usable good condition). Where the project cookstove is not in usable good condition, the project proponent must exclude such stoves from the project database for the whole crediting year and subsequent years. The project proponent may include such stoves again on replacing them with new cookstoves of similar efficiency.	Every broken or damaged stoves is to be repaired or replaced as part of the project activity during the whole crediting period. This is also backed by the photos if the stoves taken during each surveys or HH visit.
Correction 1 CORRECTION AND CLARIFICATIONS TO VM0050 ENERGY EFFICIENCY AND FUELSWITCH MEASURES IN COOKSTOVES, V1.0	The third paragraph on page 14 should be read as follows: The initial baseline survey must be performed prior to validation. The project proponent may employ local third-party agencies to carry out the baseline survey. Follow-up baseline surveys must be conducted at most every five years from the date of the last survey in control households that do not participate in the project. The project proponent may conduct	The baseline was estimated in 2022, during the baseline and project surveys organized prior to project activities. These surveys were audited as part of the validation of the project in 2024. Since then, and since the methodology change, RDIS and Kiasi have identified a 120 HH pool of unequipped HHs. KPTs will be run at least every 5 years on these control HHs to follow potential evolution of the baseline scenario through time. The first follow up KPTs

	additional surveys at any time, including at crediting period renewal.	on control HHs is planned to take place in Q1 2027. Additional Kitchen surveys have been carried out in 2025 on this pool of HHs to evaluate their cooking habits. The project therefore satisfies this condition.
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Evidence that the non-renewable biomass has been in use since 1989

The FAO country report on the extent, characteristics, and changes in Rwanda's forests in 2020 provides a list of 13 key natural forests in Rwanda and their change over time from 1984 to 2015. The report highlights a steady decrease in natural forests and parks during this period¹⁶. When considering this information alongside the data in the table above, it can be concluded that non-renewable biomass has been utilized in Rwanda since 31-December-1989.

Table 3: Decrease of Rwandan Natural Forests from 1984 to 2015

Name of the forest	Area (ha) 1984	Area (ha) 2015	% Loss
Buhanda Natural Forest	1116	18	98.4%
Gishwati Natural Forest	21213	93.2%	93.2%
Mashyuza Natural Forest	85	6	92.7%
Ibanda-Makera Natural Forest	1425	169	88.1%
Karama Natural Forest	3235	1061	67.2%
Dutake Natural Forest	31	11	65.7%
Karehe-Gatuntu Natural Forest Complex	48	19	60.3%
Nyagасыnyi Natural Forest	45	19	58.2%
Akagera National Park	267,741	112,185	58.1%
Mukura Natural Forest	4376	1988	54.6%
Sanza Natural Forest	49	24	51.0%
Mashoza Natural Forest	36	18	51.0%
Muvumba Natural Forest	1286	688	46.5%
Ndoha Natural Forest	39	29	26.0%
Kibirizi-Muyira Natural Forest	454	352	22.4%
Busaga Natural Forest	191	159	16.9%
Nyungwe National Park	112,230	101,005	10%

¹⁶ <https://www.fao.org/3/ca9878fr/ca9878fr.pdf>

Volcanoes National Park	16,128	16,004	0.8%
Total	429,728.47	235,192.27	45.27%

3.3 Project Boundary

Source		Gas	Included?	Justification/Explanation
Baseline	Emission from use of non-renewable biomass	CO ₂	Yes	Major Source
		CH ₄	Yes	No other source identified
		N ₂ O	Yes	No other source identified
		Other	No	No other source identified
Project	Emission from use of non-renewable biomass	CO ₂	Yes	Major Source
		CH ₄	Yes	No other source identified
		N ₂ O	Yes	No other source identified
		Other	No	No other source identified

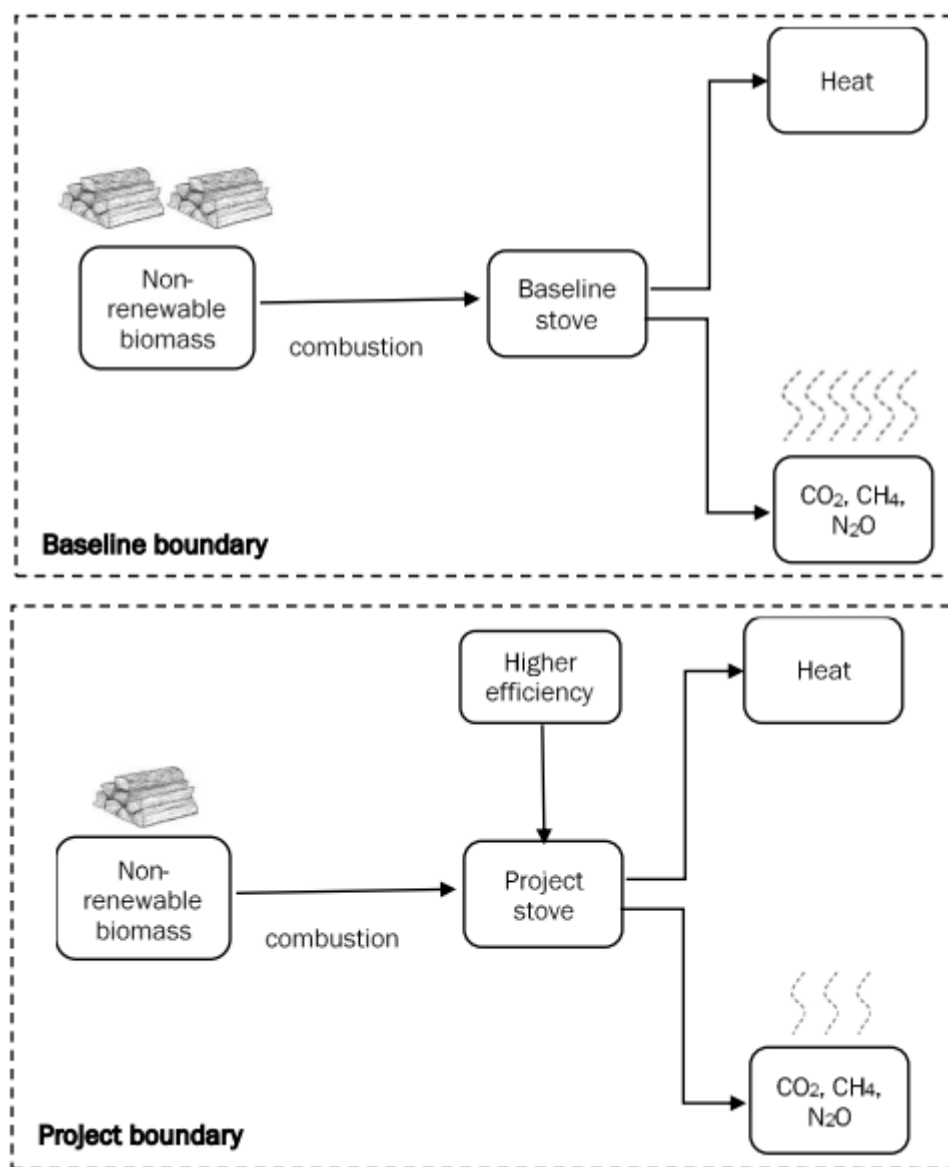


Figure 9: Project boundary and Baseline boundary

3.4 Baseline Scenario

The baseline scenario is the scenario that would most likely have happened in the absence of the project. For this project, it corresponds to the continued use of non-renewable wood fuel (firewood) by the target population to meet similar thermal energy needs as provided by project cookstoves, in absence of project activity.

The project was designed to specifically equip households that cook with 3-stone fire (firewood). As explained in part design of the project, Rwanda classifies households as of their equipment level. Level 4, for instance, represent HHs that already have access to a gas or electric cooking method. These HHs are not offered the possibility to be part of the project (they represent a very tiny proportion of the

population), as it would not be useful to them. HHs which usually use charcoal have an improved stove to cook with charcoal. HHs with any improved cookstoves solutions are not included in the project activities. Our KPT focused on firewood for 2 reasons:

- It is by far the most common fuel used in Rusizi district, a rural district in Western Rwanda (~95%).
- Our stoves are meant to replace 3 stone fires exclusively, and HHs participating were all using 3 stones fires (therefore wood fuel) before RDIS provided an ICS. The baseline is the continuous used of 3-stones fire as the HHs are offered the possibility to participate specifically over that criterion.

Additionally, this question is part of the kitchen and usage surveys that will be carried out annually. We will ask HHs the different type of fuel they use on a daily basis.

In rural areas in Rwanda, a very large part of the population uses firewood as main fuel for cooking. The document *Policy and market review for modern energy cooking in Rwanda*, dated from June 2021, mentions: “Firewood accounts for 93% of the cooking fuel used in rural areas, while charcoal is predominant in urban areas.” Rusizi district is almost exclusively rural.¹⁷ Another chapter in this document explains that “Charcoal is substantially more expensive than firewood, which can be often collected for free”. In addition to this, a CASE Project ran a study¹⁸ mentioning that the households that were not exclusively using firewood were usually using a combination of charcoal and firewood for cooking.

In addition to this, Kiasi and RDIS run 120 Kitchen Performance Tests in Rusizi district prior to the project start date, from 22-November-2022 to 25-November-2022. Results from this KPT are available on demand. This allowed the determination of an important value: the consumption of wood per households in the project region with baseline device. On average, households from Rusizi district use 3.67 tons of wood fuel per year for cooking purposes.

During the methodology change procedure, Kiasi also added a dynamic baseline group of 120 HHs that were surveys in October 2025 and will not be equipped with an improved cookstove. Over the project lifespan, this group will be followed to estimate potential changes in fuel, cooking methods or habits.

3.5 Additionality

3.5.1 Regulatory Surplus

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

☐ Annex 1 country

☒ Non-Annex 1 country

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

¹⁷ <https://mecs.org.uk/wp-content/uploads/2021/10/Policy-and-market-review-for-modern-energy-cooking-in-Rwanda.pdf>

¹⁸ <https://cleancooking.org/binary-data/RESOURCE/file/000/000/60-1.pdf>

☐ Yes

☒ No

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

☐ Yes

☒ No

No mandated laws, statutes, or other regulatory frameworks require project activities.

3.5.2 Additionality Methods

The methodology uses activity method for the demonstration of additionality.

Step 1: Regulatory Surplus

The project to distribute domestic fuel efficient cookstoves in the host country is voluntary, as there is no mandated government program or policy requiring it. However, the project is aligned with Rwanda's Energy Sector Strategy Plan¹⁹, which aims to promote efficient technologies and reduce the reliance on firewood. The project's approach to market development is also in line with the plan's principles, seeking to establish an enabling environment for private sector engagement and investment. The targeted households in the project area will receive a stove on a voluntary basis to help achieve a sustainable balance between the supply and demand of biomass. Overall, the project represents a proactive effort to promote sustainable development in the country.

Step 2: Positive List

Projects are on the positive list if they meet all the following criteria:

1. The project activity introduces efficient biomass-fired that replace inefficient biomass fired cookstoves.
2. The project activity installs or distributes the project devices at zero cost to the end-user and has no other source of revenue other than carbon credits.

The project meets the applicability conditions of the methodology which represent the positive list. The project installs the firewood ICS at zero cost to the household and has no other source of revenue other than the sale of GHG credits. The project is not implemented as part of government schemes or supported by multilateral funds.

Conclusion

The project fulfils both conditions above, it is therefore additional.

¹⁹ https://www.reg.rw/fileadmin/user_upload/Final_ESSP.pdf

3.6 Methodology Deviations

The project did not apply any methodology deviations.

However, please note this PD is a reviewed PD, changing the methodology from VM0006 v1.2 to VM0050 v1.0 to ensure compliance with the most demanding international carbon scheme. During this methodology change additional information on stakeholders have also been added.

4 QUANTIFICATION OF ESTIMATED GHG EMISSION REDUCTIONS AND REMOVALS

4.1 Baseline Emissions

Baseline emissions are calculated as follows:

$$BE_y = \sum_{i,j,k} EC_{i,y} * N_{j,k,y} * n_{j,k,y} * (EF_{b,i,CO2} * f_{NRB,y} * (1 - u_d) + EF_{b,i,nonCO2})$$

(Equation 1)

Where:

Variable	Meaning	Project value
BE_y	Baseline emissions during year y (t CO2e)	Calculated from equation 1
$EC_{i,y}$	Average energy consumption of baseline device type i in year y (TJ)	Calculated from equation 2 (below)
$N_{j,k,y}$	Number of commissioned project devices of type j from batch k in year y	1 Calculation provided here will account for 1 operating stove. Overall, the project aims to distribute 100 000 stoves.
$n_{j,k,y}$	Proportion of commissioned project devices of type j from batch k that remain operating in year y (fraction)	1 Calculation provided here will account for 1 operating stove.

		During monitoring, usage rate will be surveyed and accounted for in calculation.
EF_{b,i,CO_2}	CO2 emission factor for fuel used by baseline device type i in the baseline scenario (t CO2/TJ)	112 tCO ₂ /TJ (IPCC default for wood fuel)
$f_{NRB,y}$	Fraction of woody biomass that is established to be non-renewable used by baseline device in year y; this variable is not considered for fossil fuels (fraction)	0.917 (calculated with TOOL 30)
u_d	Uncertainty associated to the calculation of $f_{NRB,y}$ and to be removed, as required by tool 30.	0.26
$EF_{b,i,nonCO_2}$	Non-CO2 emission factor for fuel used by baseline device type i in the baseline scenario (t CO2e/TJ)	9.46 tCO _{2eq} /TJ (IPCC default for wood fuel)
i	Baseline device type and its respective fuel type	i=1 All beneficiaries were initially cooking with three stones fires (firewood)
j	Project device type and its respective fuel type	j=1 as the project activities only provides 1 type of stoves which uses firewood.

Average Energy Consumption of Baseline Device ($EC_{i,y}$)

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

$$EC_{i,y} = BC_{b,i,y} * NCV_{b,i}$$

(Equation 2)

Table 4 Parameters used to calculate Average energy Consumption of Baseline Devices

Variable	Meaning	Project value
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$EC_{i,y}$	Average energy consumption of baseline device type i in year y (TJ)	Calculated from equation 2
$BC_{b,i,y}$	Fuel used per baseline device type i during year y	3.67 t/stove/year <i>Extracted from baseline surveys previously audited.</i>
$NCV_{b,i}$	Net calorific value of baseline fuel for baseline device type i	0,0156 TJ/tonne <i>(IPCC default for woodfuel)</i>

From equation 1 and 2, detailed above, and from the values detailed in the tables above for each variable, we obtain a baseline emissions value of:

$$BE_y = 3.67 \frac{t}{y} / stove = \frac{10.07kg}{day} / stove$$

4.2 Project Emissions

Project emissions will be calculated as follows:

$$PE_y = PE_{energy,y} + PE_{others,y}$$

(Equation 3)

Variable	Meaning	Project value
PE_y	Project emissions during year y (t CO2e)	Calculated yearly from equation 3
$PE_{energy,y}$	Project emissions from energy consumption of project devices in year y (t CO2e)	Calculated from equation 4 (below)
$PE_{others,y}$	Project emissions from other sources in year y (t CO2e)	Calculated from equation 5 (below)

Project emissions from energy consumption (woodfuel) of project devices in year y will be calculates as follows:

$$PE_{energy,y} = \sum_j \sum_k BC_{p,i,k,y} * N_{j,k,y} * NCV_{p,j} * n_{j,k,y} * (EF_{p,i,CO2} * f_{NRB,y} * (1 - u_d) + EF_{p,i,nonCO2})$$

(Equation 4)

Variable	Meaning	Project value
$PE_{energy,y}$	Project emissions from energy consumption of project devices in year y (t CO ₂ e)	Calculated from equation 4
$BC_{p,i,k,y}$	Average quantity of woodfuel used per project device type j from batch k during year y	For estimation purposes: 4.15kg/day/HH 1.5t/year/HH <i>Actual value to be monitored yearly with KPTs.</i>
$N_{j,k,y}$	Number of stoves of type j from batch k installed in year y.	1 <i>Project emissions are accounted for 1 stove during 1 year (=1 batch)</i>
$NCV_{p,j}$	Net calorific value of baseline fuel for baseline device type i	0,0156 TJ/tonne <i>(IPCC default for woodfuel)</i>
$n_{j,k,y}$	Proportion of commissioned project devices of type j from batch k that remain operating in year y	1 <i>Approximation for 1 stove still operating</i>
EF_{p,i,CO_2}	CO ₂ emission factor for fuel used by baseline device type i in the baseline scenario	112 tCO ₂ e/TJ <i>Default for woodfuel in the most recent version of the IPCC</i>
$f_{NRB,y}$	Fraction of woody biomass that is established to be non-renewable used by baseline device in year y; this variable is not considered for fossil fuels	91.7% <i>Calculated from TOOL30 and applying a deduction of 26%</i>
u_d	Uncertainty associated to the calculation of $f_{NRB,y}$ and to be removed, as required by tool 30.	0.26
$EF_{p,i,nonCO_2}$	Non-CO ₂ emission factor for fuel used by baseline device type i in the baseline scenario	9,46 tCO ₂ e/TJ <i>Default for wood fuel in the latest version of IPCC</i>

Number of Improved cookstoves $N_{0,i,j}$

Each batch is represented by 1 stove. Table 5 is the evolution of the number of stoves distributed as part of the project over time:

Table 5: Expected evolution of the number of operating cookstoves

	Year 1	Year 2	Year 3	Year 4	Active stoves
Year 1	22500				22500
Year 2	22500	22500			45000
Year 3	22500	22500	22500		67500
Year 4	22500	22500	22500	22500	90000
Year 5	21250	22500	22500	22500	88750
Year 6	21250	21250	22500	22500	87500
Year 7	20000	21250	21250	22500	85000
Year 8	18750	20000	21250	21250	81250
Year 9	0	18750	20000	21250	60000
Year 10	0	0	18750	20000	38750

Each broken stove will be replaced. To account for the evolution of stoves still in use, we have estimated the following usage rates:

Year	Usage Rate (expected)
Year 1	90%
Year 2	90%
Year 3	90%
Year 4	90%
Year 5	85%
Year 6	85%
Year 7	80%
Year 8	75%
Year 9	0
Year 10	0

However, the proportion of commissioned project devices of type i and batch j that remain operating in year y will be monitored yearly to have an accurate estimate of the operating stoves.

And all other non-energy consumption emissions related to the project will be accounted for with the following equation:

$$PE_{others,y} = PE_{transp,y} + PE_{prod,y} + PE_{fugitive,y} + PE_{backup,y}$$

(Equation 5)

Variable	Meaning	Project value
$PE_{others,y}$	Project emissions from other sources in year y (t CO ₂ e)	0 tCO ₂ e/y <i>Calculated from equation 5</i>
$PE_{transp,y}$	Project emissions due to fuel transportation in year y (t CO ₂ e)	0 tCO ₂ e/y <i>To be estimated where the average transportation distance is greater than 200 km. This is not the case as wood is collected or purchased within the rusizi district (75km wide).</i>
$PE_{prod,y}$	Project emissions due to fuel production in year y (t CO ₂ e)	0 tCO ₂ e/y <i>Determined with CDM TOOL16 Project and Leakage Emissions from Biomass; Project do not cultivate biomass, nor uses wood waste as biomass. Therefore, this factor is set to 0.</i>
$PE_{fugitive,y}$	Fugitive emissions in year y (t CO ₂ e)	0 tCO ₂ e/y <i>NA: we only distribute firewood stoves, not charcoal</i>
$PE_{backup,y}$	Project emissions from backup generators in year y (t CO ₂ e)	0 tCO ₂ e/y <i>NA: The project stoves do not use electricity</i>

4.3 Leakage Emissions

Leakage emissions associated with reduced or avoided use of non-renewable biomass will be accounted for by introducing a 0.95 factor applied to GHG ER calculation equation (see equation 6 below)

4.4 Estimated GHG Emission Reductions and Carbon Dioxide Removals

Yearly emission reductions will be calculated from the previously obtained values using the following equation:

$$ER_y = (BE_y + PE_y) * 0.95 - LE_{RB,y}$$

(Equation 6)

Variable	Meaning	Project value
ER_y	Emission reductions during year y (t CO ₂ e)	Calculated from equation 6
BE_y	Baseline emissions during year y (t CO ₂ e)	Calculated from equation 1
PE_y	Project emissions during year y (t CO ₂ e)	Calculated from equation 3, 4, 5
$LE_{RB,y}$	Leakage emissions associated with use of renewable biomass during year y (t CO ₂ e)	0 Accounted for in equation 1 and 2 by retrieving 26% to the calculated fNRB.

From all the values and equation above, we were able to estimate the expected yearly emissions reductions, which are presented in the following table:

Vintage period	Estimated baseline emissions (tCO ₂ e)	Estimated project emissions (tCO ₂ e)	Estimated leakage emissions (tCO ₂ e)	Estimated reduction VCU (tCO ₂ e)	Estimated removal VCU (tCO ₂ e)	Estimated total VCUs (tCO ₂ e)
15-May-2023 to 14-May-2024	110 255	45 438	3 241	61 576	NA	61 576
15-May-2024 to 14-May-2025	220 509	90 875	6 482	123 152	NA	123 152
15-May-2025 to 14-May-2026	330 764	136 313	9 723	184 729	NA	184 729

15-May-2026 to 14-May-2027	441 019	181 751	12 963	246 305	NA	246 305
15-May-2027 to 14-May-2028	434 894	179 226	12 783	242 884	NA	242 884
15-May-2028 to 14-May-2029	428 768	176 702	12 603	239 463	NA	239 463
15-May-2029 to 14-May-2030	416 518	171 653	12 243	232 621	NA	232 621
15-May-2030 to 14-May-2031	398 142	164 080	11 703	222 359	NA	222 359
15-May-2031 to 14-May-2032	294 013	121 167	8 642	164 203	NA	164 203
15-May-2032 to 14-May-2033	189 883	78 254	5 581	106 048	NA	106 048
Total	3 264 765	1 345 459	95 965	1 823 340	0	1 823 340

Stoves' maintenance and calculation method

These calculations have been made with maintenance of the stoves but without replacement after 8 years. However, we hope to replace every broken stove to keep the number of stoves to 100 000 by the end of the crediting period. This calculation will be adjusted with the actual number of operational stoves at each monitoring.

At the end of the lifespan (8 years) or in case of breakage, the stoves will either be replaced by a new stove with exact same properties (reinitializing efficiency decrease) or will be repaired.

As per the national standard RSB (Rwanda Standard Board), our stove is Tier 5 (“Best”) in terms of durability. RSB test was carried out in accordance with norm ISO 19867-1 (2018). Additionally, the staff repairing a stove is required to keep trace by filling in a form including date, reparation carried out, personnel name.

5 MONITORING

5.1 Data and Parameters Available at Validation

Parameters fixed ex ante and used to calculate baseline emissions:

Data / Parameter	EF _{b,i,CO2} EF _{p,i,CO2}
Data unit	tCO ₂ /TJ
Description	CO ₂ emission factor for non-renewable woody biomass (both baseline and project scenario)
Source of data	2006 IPCC Guidelines for National Greenhouse Gas Inventories; Volume 2 Energy, Chapter 2 Stationary Combustion
Value applied	112 tCO ₂ /TJ
Justification of choice of data or description of measurement methods and procedures applied	IPCC default for wood fuel as per applied approved methodology VM0050, v1.0
Purpose of data	Calculation of baseline emissions, calculation of project emissions
Comments	The value is fixed ex-ante

Data / Parameter	EF _{b,i,nonCO2} EF _{p,i,nonCO2}
Data unit	tCO _{2e} /TJ
Description	Non-CO ₂ emission factor for non-renewable woody biomass
Source of data	IPCC Default emissions factor
Value applied	9.46 tCO ₂ /TJ
Justification of choice of data or description of measurement methods and procedures applied	Default from IPCC for woodfuel
Purpose of data	Calculation of baseline and project emissions.

Comments	The value is fixed ex-ante
Data / Parameter	$NCV_{b,i}$ $NCV_{p,j}$
Data unit	TJ/ton
Description	Net calorific value of the non-renewable woody biomass that is substituted or reduced
Source of data	Default value from IPCC
Value applied	0.0156 TJ/t
Justification of choice of data or description of measurement methods and procedures applied	Default value from IPCC is used in methodology VM0050 v1.0 and AMS-II.G v13.0.
Purpose of data	Calculation of baseline and project emissions.
Comments	The value is fixed ex-ante

Data / Parameter	Lifespan
Data unit	Number
Description	Expected life duration of the stoves.
Source of data	Manufacturer's specifications
Value applied	8 years
Justification of choice of data or description of measurement methods and procedures applied	Manufacturer provided documents certifying the expected life duration of the stoves liner they offer. Additionally, the Rwandan Board of Standards certified that this stoves model has a high durability (best score).
Purpose of data	Emission Reduction calculation
Comments	Fixed ex-ante We have a monthly visit to the stove manufacture to evaluate proper manufacturing conditions

Data / Parameter	$f_{NRB,y}$
------------------	-------------

Data unit	Fraction
Description	Fraction of woody biomass that can be established as non-renewable biomass
Source of data	Calculated with CDM TOOL 30 v 4.0. Calculation sheet will be provided on demand.
Value applied	91.7%
Justification of choice of data or description of measurement methods and procedures applied	Calculated with CDM TOOL 30 v 4.0. Calculation sheets will be provided on demand. Appendix 2 provides comparison and analysis of calculated value as required by TOOL30 v4.0.
Purpose of data	Calculation of project and baseline emissions
Comments	This value is fixed ex ante and do not need to be revised, as it is not a default value that may be updated in the future.

Data / Parameter	$BC_{exante,b,i}$
Data unit	Tons/year
Description	Ex-ante quantity of woody biomass used per baseline device type i
Source of data	Extracted from the baseline KPTs carried out before the project activities in the Rusizi district. As per option 1 proposed by the methodology for the estimation of this parameter.
Value applied	3.67 t/HH/year 10.07kg/HH/day
Justification of choice of data or description of measurement methods and procedures applied	This value was determined during the baseline survey through a Kitchen Performance Test ²⁰ (KPT v4.0 as defined by Clean Cooking Alliance) carried on 120 households of the Rusizi district. Data can be provided on demand. For 3 days, HHs wood consumption was carefully assessed (by weighing a predefined pile of wood) to estimate an average of the daily and yearly HHs fuelwood consumption.

²⁰ <https://cleancooking.org/binary-data/DOCUMENT/file/000/000/604-1.pdf>

	These tests were carried out in accordance with the requirements from the latest version of “sampling and surveys for CDM project activities and programme of activities”: The conditions for cooking are homogeneous, as the method used by all HHs that will integrate the project are the 3 stones fire method. Therefore, only 1 sampling group is needed. For methodology purposes, the minimal number of surveys to be carried out was 100. To be conservative, we decided to survey 120 HHs. These surveys were carried out in various locations to be as representative as possible. Additionally, the monitoring period being longer than 1 year, the result may be extrapolated for the monitoring period, as stated in methodology. The value estimated through our KPTs do meet the 90/10 confidence criteria. We decided to refer to POA GS5047 African Improved Cookstoves and Clean Water Program for confirmation of the results. This Project is located in Nyungwe district, which is one of Rusizi’s neighboring district. Both districts are part of the western region of Rwanda. The close location and similar type of Project made it appropriate. In this project, KPTs were carried out to evaluate Pby, the specific fuel consumption for an individual technology in baseline scenario b during year y. Pby is therefore the GS equivalent for Bold,HH. KPTs were audited by a VVb and the Project is certified. The value used in the PD is of 0.011 t/day of fuelwood for 1 HH. The value has been reviewed every 2 years for good practices. The latest value used and referred to in monitoring report is of 0.01031 t/day (from a 2019 survey). However, $0.01031 \times 365 = 3.76$ t of fuelwood/HH/year. We kept the most conservative of both values, therefore 3.67 t/HHs/year.
Purpose of data	Calculation of baseline emissions
Comments	This value is fixed ex ante for the entire crediting period but shall be confirmed with KPTs along the project lifespan, at least every 5 years.
Data / Parameter	Hhi Hhj,k
Data unit	Equivalent standard male adults
Description	Average HH size of the target population using device type i

	Average HH size of the target population using device type j from batch k
Source of data	Baseline Kitchen surveys, baseline KPTs, project KPTs
Value applied	3.9
Justification of choice or description of measurement methods and procedures applied	Regarding the surveys: - VCS requires a minimum of 100HHs sample, we plan to run 120 HHs surveys to ensure conformity. We also plan to ensure that HHs from various locations and different stoves' ages will be part of the sample. - 90/10 precision compared to estimated value.
Purpose of data	Cross checking fuel and energy consumption values
Comments	This value is fixed ex-ante

Data / Parameter	u_d
Data unit	%
Description	Uncertainty deduction for $f_{NRB,y}$
Source of data	Estimated based on uncertainty requirements : The following uncertainty deduction must be applied, depending on the procedure for $f_{NRB,y}$ used from VM0050v1.0.: 1) If the default value for $f_{NRB,y}$ from TOOL33 is applied: $u_d = 0$ 2) If $f_{NRB,y}$ is calculated as per TOOL30: $u_d = 26\%$ 3) If $f_{NRB,y}$ from an approved standardized baseline is applied: $u_d = 26\%$
Value applied	26%
Justification of choice of data or description of measurement methods and procedures applied	$f_{NRB,y}$ was calculated with TOOL 30, therefore this uncertainty shall be applied.
Purpose of data	Calculation of ERs
Comments	This value is fixed ex ante

Data / Parameter	Adj _{LE}
Data unit	-
Description	Discount factor to account for leakage related to the non-renewable woody biomass saved by the project activity
Source of data	as per described in the methodology VM0050 v1.0.
Value applied	0.95
Justification of choice of data or description of measurement methods and procedures applied	Default value
Purpose of data	Calculation of project and baseline emissions
Comments	This value is fixed ex ante.

5.2 Data and Parameters Monitored

Data / Parameter	N _{j,k,y}
Data unit	Number
Description	Number of project devices of type I and batch j commissioned
Source of data	TDR: carbon transfer form will give the date of commissioning for each stove
Description of measurement methods and procedures to be applied	CTFs are dated from the date of commissioning of the ICS. Kiasi and RDIS hold a database that includes: - Each device distributed. - Indication to identify the stove: unique ID number, GPS coordinates. - The information about the beneficiaries: name, address, phone number when available - This database will be referred to for evaluation of the precise number of devices commissioned. Additionally, please note CTFs are signed only when the stove is commissioned (1 week after installation). Therefore, the date of CTF signature corresponds to a point when the stove is fully operational and actively used by the household.

Frequency of monitoring/recording	Every year
Value applied	For ex-ante emission reduction calculation, it is assumed that the project will be distributed: - 25 000 stoves in year 1 - 25 000 stoves in year 2 (50 000 applied for estimation) - 25 000 stoves in year 3 (75 000 applied for estimation) 25 000 stoves in year 4 (100 000 applied for estimation)
Monitoring equipment	Project Database
QA/QC procedures to be applied	
Purpose of data	Calculation of emission reductions
Calculation method	1 stove = 1 batch. CTFs will give the exact number of stoves distributed per year.
Comments	

Data / Parameter	Date of commissioning of batch j
Data unit	Date
Description	Date on which each stove is distributed and installed in a batch. Each individual stoves distributed are considered as separate batches.
Source of data	TDR: Carbon transfer form will give the date of commissioning for each stove, along with unique ID number, GPS coordinates, and beneficiary information Internal Records
Description of measurement methods and procedures to be applied	CTFs are dated from the date of commissioning (or after) of the ICS. Kiasi and RDIS hold a database that includes: • Each device distributed. • Indication to identify the stove: unique ID number, GPS coordinates. • The information of the beneficiaries: name, address, phone number when available

	This database will be referred to for evaluation of the precise number of devices commissioned. Additionally, please note CTFs are signed and dated only when the stove is commissioned (1 week after installation to allow for the material to dry). Therefore, the date of CTF signature corresponds to a point when the stove is fully operational and actively used by the household.
Frequency of monitoring/recording	Every year (TDR are updated and monitored weekly, the database will be audited yearly)
Value applied	1
QA/QC procedures to be applied	-
Purpose of data	Calculation of emission reductions
Calculation method	1 stove = 1 batch. CTFs will give the exact date of commissioning of each stove distributed.
Comments	For calculation, the date of commissioning of the batch will be used to evaluate ER. It will vary from one batch of stove to another.

Data / Parameter	Date of commissioning of project device i
Data unit	Date
Description	Date on which each stove distributed and installed was commissioned.
Source of data	TDR: carbon transfer form will give the date of commissioning for each stove, along with unique ID number, GPS coordinates, and beneficiary information
Description of measurement methods and procedures to be applied	CTFs are dated from the date of commissioning of the ICS. Kiasi and RDIS hold a database that includes: - Each device distributed. - Indication to identify the stove: unique ID number, GPS coordinates. - The information of the beneficiaries: name, address, phone number when available

	This database will be referred to for evaluation of the precise number of devices commissioned. Additionally, please note CTFs are signed only when the stove is commissioned (1 week after installation to allow for the material to dry). Therefore, the date of CTF signature corresponds to a point when the stove is fully operational and actively used by the household.
Frequency of monitoring/recording	Every year (TDR are updated and monitored weekly, the database will be audited yearly)
Value applied	For calculation, the exact date of commissioning will be used to evaluate ER. It will vary from one stove to another.
Monitoring equipment	Database of the project
QA/QC procedures to be applied	-
Purpose of data	Calculation of emission reductions
Calculation method	1 stove = 1 batch. CTFs will give the exact date of commissioning of each stoves distributed.
Comments	-

Data / Parameter	$BC_{b,i,y}$
Data unit	Tons/year
Description	Fuel used per baseline device type I in year y
Source of data	Extracted from the baseline follow up KPTs carried out every 5 years in the Rusizi district. As per option 1 proposed by the methodology for the estimation of this parameter.
Description of measurement methods and procedures applied	This value will be determined during the baseline survey through a Kitchen Performance Test ²¹ (KPT v4.0 as defined by Clean Cooking The value estimated through our KPTs shall meet the 90/10 confidence-precision criteria.

²¹ <https://cleancooking.org/binary-data/DOCUMENT/file/000/000/604-1.pdf>

Frequency of the monitoring	Every 5 years
Value applied	3.67 t/HH/year 10.07kg/HH/day
Monitoring equipment	Scales, forms
QA/QC procedures to be applied	-
Purpose of data	Calculation of baseline emissions
Calculation method	Baseline KPTs on a pool of 120 HHs not equipped with improved cookstoves that will be followed throughout the project lifespan.
Comments	This value is fixed ex ante for the entire crediting period but shall be confirmed with KPTs along the project lifespan.

Data / Parameter	$BC_{p,j,k,y}$
Data unit	Tons/year
Description	Average quantity of fuel used by project device type j from batch k during year y
Source of data	Extracted from the project follow up KPTs carried out every 1 to 2 years in the Rusizi district. As per option 1 proposed by the methodology for the estimation of this parameter.
Description of measurement methods and procedures applied	This value will be determined during the baseline survey through a Kitchen Performance Test (KPT v4.0 as defined by Clean Cooking, see footnote 26). The value estimated through our KPTs shall meet the 90/10 confidence-precision criteria.
Frequency of the monitoring	Annual or biennale
Value applied	For estimation purposes: 4.15kg/day/HH=1.5t/year/HH
Monitoring equipment	Scales, forms
QA/QC procedures to be applied	-
Purpose of data	Calculation of baseline and project emissions
Calculation method	Project KPTs on a pool of HHs equipped with improved cookstoves randomly selected within the database.

Comments	-
Data / Parameter	$n_{y,i,j}$
Data unit	Proportion
Description	Proportion of commissioned project devices of type i and batch j ($N_{j,k,y}$) that remain operating in year y
Source of data	Project surveys (usage surveys)
Description of measurement methods and procedures to be applied	Based on a representative sample. A simplified approach proposed in option (b) under Section 8.4 of the VM0050 v1.0 methodology will be used for determining the minimum sample size.
Frequency of monitoring/recording	At least once every two years
Value applied	90% (for estimation purpose): because we considered that each of the broken stoves will be repaired to fill its own lifetime.
Monitoring equipment	Project database
QA/QC procedures to be applied	Regarding the surveys: - VCS requires a minimum of 100HHs sample, we plan to run 120 HHs surveys to ensure conformity. We also plan to ensure that HHs from various locations and different stoves' ages will be part of the sample. - 90/10 precision compared to estimated value.
Purpose of data	Calculation of emission reductions
Calculation method	Proportion of operational stoves obtained from the survey is multiplied by the total commissioned stoves to arrive at this value
Comments	A usage survey will confirm these results at monitoring.

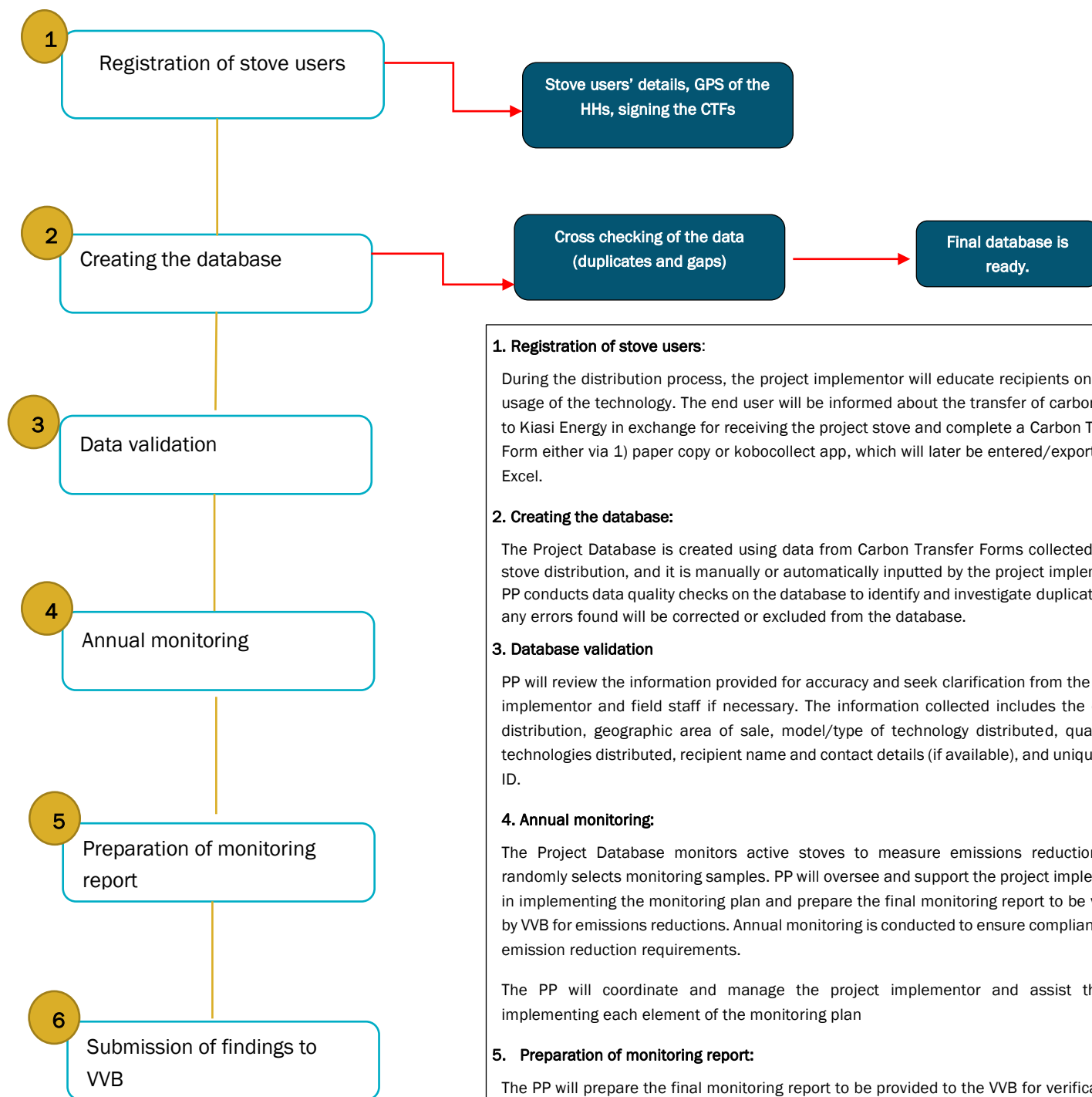
5.3 Monitoring Plan

The Monitoring Plan applied in this project involves several key elements that ensure that the PP and/or project implementer have high quality, unbiased, and reliable information regarding the performance of the

project in terms of implementation and outcomes, and for the purposes of calculating Verified Carbon Units (VCUs) following methodology VM0050 version 1.0.

Role and Responsibilities

The flow chart below illustrates the roles and responsibilities of parties during the implementation of the monitoring plan for the project.



1. Registration of stove users:

During the distribution process, the project implementor will educate recipients on proper usage of the technology. The end user will be informed about the transfer of carbon rights to Kiasi Energy in exchange for receiving the project stove and complete a Carbon Transfer Form either via 1) paper copy or kobocollect app, which will later be entered/exported into Excel.

2. Creating the database:

The Project Database is created using data from Carbon Transfer Forms collected during stove distribution, and it is manually or automatically inputted by the project implementor. PP conducts data quality checks on the database to identify and investigate duplicates, and any errors found will be corrected or excluded from the database.

3. Database validation

PP will review the information provided for accuracy and seek clarification from the project implementor and field staff if necessary. The information collected includes the date of distribution, geographic area of sale, model/type of technology distributed, quantity of technologies distributed, recipient name and contact details (if available), and unique stove ID.

4. Annual monitoring:

The Project Database monitors active stoves to measure emissions reductions and randomly selects monitoring samples. PP will oversee and support the project implementor in implementing the monitoring plan and prepare the final monitoring report to be verified by VVB for emissions reductions. Annual monitoring is conducted to ensure compliance with emission reduction requirements.

The PP will coordinate and manage the project implementor and assist them in implementing each element of the monitoring plan

5. Preparation of monitoring report:

The PP will prepare the final monitoring report to be provided to the VVB for verification of emission reductions.

Data monitored

The table below provides a summary of the data requirements for field measurements:

Table 6: Parameters to be monitored

Parameter to be Monitored	Description	Method of Data Collection
$N_{0,i,j}$	Number of project devices of type i and batch j commissioned	Project database: our database collects all information on the stoves distributed: date of commissioning, HHs information (name, address, phone number if available), GPS coordinates, ID number, ...
$n_{y,i,j}$	Proportion of commissioned project devices of type i and batch j ($N_{0,i,j}$) that remain operating in year y	Usage surveys of 120 HHs of ICS users randomly selected from the database following 90/10 precision requirement
$BC_{p,j,k,y}$	Average quantity of woodfuel used per project device type j from batch k during year y	KPTs or direct measurement with a required precision of 90/10 to be fulfilled. Biennale or annual
$BC_{b,j,y}$	Average quantity of woodfuel used per baseline device type j during year y	Follow up baseline surveys (KPTs) to be performed every 5 years. Must follow a 90/10 precision criteria. If the difference between fixed ex-ante values and follow up values is over 30%, the value used may have to be updated in the calculation.

Project surveys will include:

- Usage surveys will be run annually and used to to gather information on stove usage patterns and to explore changes in project scenario over time, in terms of cooking as well as in terms of SDGs contribution (health indicators, gender indicators, ...). The proportion of commissioned devices that remain operated will be extracted from the results of these surveys.
- Project KPTs will be run annually to evaluate the average annual quantity of woodfuel used per project device per year. Different stove age categories will be represented in project surveys.

This will be completed annually beginning within 1 year after distribution. The forms to be used while carrying the annual project surveys can be provided on demand. Additional questions may be added if needed.

Baseline surveys plan will include:

- Kitchen surveys will be used to collect data on stove usage patterns and monitor the project's evolving impact on cooking practices and SDG contributions (including health and gender indicators) over time.
- Baseline KPTs to evaluate the average annual quantity of wood fuel used per baseline device per year and ensure that the fundamental baseline scenario remains stable throughout the project's duration.

To track the potential evolution of baseline cooking habits (device, fuel used, amount of fuel, etc.), a dynamic baseline approach was implemented following the methodology change in 2025. A specific cohort of 120 households (HHs) cooking with wood fuel and 3-stone fires was established (surveyed) in S2 2025 and will be monitored at least every 5 years. Crucially, these HHs will not receive an improved cookstove. The follow-up Kitchen Performance Tests (KPTs) and usage surveys for this cohort will begin in Y4 of project activity.

Sampling plan:

To avoid the high costs of monitoring every single ICS unit distributed in the project, representative sampling will be used. The sampling plan will be designed to comply with the requirements of the VM0050 v1.0 methodology. The project will adopt the simple random sampling approach described in the methodology. This approach outlines minimum sample sizes based on the project target population size. For instance, if the project target population is less than 300, a minimum sample size of 30 will be used. If the target population is between 300 and 1000, the minimum sample size will be 10% of the group size. Finally, if the project target population is greater than 1000, the minimum sample size will be 100. We will run our Kitchen Survey and Usage Surveys on a sample of 120 HHs randomly selected.

The parameters to be monitored by project surveys include the parameters listed above in table 5. Monitoring more than one parameter within the same sample (households) can reduce travel needs and associated costs while ensuring random selection of samples for every parameter. The individual users will be randomly selected from the project database. Geographical locations are assumed to have no influence on the parameters, however, we will ensure that the sampling plan always include HHs spread within the whole district to account for discrepancies. The random sample will be reselected each monitoring period to ensure it remains random, except for baseline data which will use the same pool of unequipped HHs,, and trained personnel from the project Implementor or PP team will conduct the surveys within the end date of the project monitoring periods.

Data collection and storage

The sampling plan incorporates various measures to ensure high-quality data. The PP will ensure that the field personnel comprehend the monitoring plan and achieve the minimum sample size during each monitoring session and document any refusals or non-responses. The project implementer and/or field team will be trained appropriately to minimize bias while surveying households. To ensure random selection of replacement households, an additional number of households will be selected in addition to the minimum sampling requirements. The use of well-designed questionnaires and rigorous testing will be employed to minimize interviewer bias. Hard copies of surveys will be stored in-country, while mobile monitoring data collection tool surveys will be backed up online by the PP and project database. All monitored data required for verification and issuance will be kept for two years beyond the end of the crediting period or the final issuance of VCU for the project activity.

Assessment for Leakage:

According to methodology VM0050, version 1.0, section 8.3: Leakage shall be considered as default 0.95 in accordance with Section 5.4 of AMS II.G. v13.0 therefore default value of leakage as 0.95 will be applied.

APPENDIX 1: COMMERCIALLY SENSITIVE INFORMATION

No sensitive information is contained in this PD. Supporting documents shared with the VVB are not meant to be disclosed.

Contracts and financial overviews are confidential, and so will be end-users' information contained in the database during monitoring.

APPENDIX 2: CALCULATION OF FNRB

Determination of the fraction on non-renewable biomass

As per the CDM tool “Calculation of the fraction of non-renewable biomass” (V.4.0)²². The overall equation to be applied is:

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

where:

fNRB: Fraction of non-renewable biomass (fraction or %)

NRB: Quantity of non-renewable biomass (t/yr)

RB: Quantity of renewable biomass (t/yr)

The quantity of non-renewable biomass is derived by the equation given by:

$$NRB = H - RB \quad (\text{equation 2 of tool})$$

where:

H: Total annual consumption of wood in the absence of the project activity in tons/yr

Determination of the total wood consumption H

$$H = HW * N + CE + NE - RB \quad (\text{equation 3 of tool})$$

where:

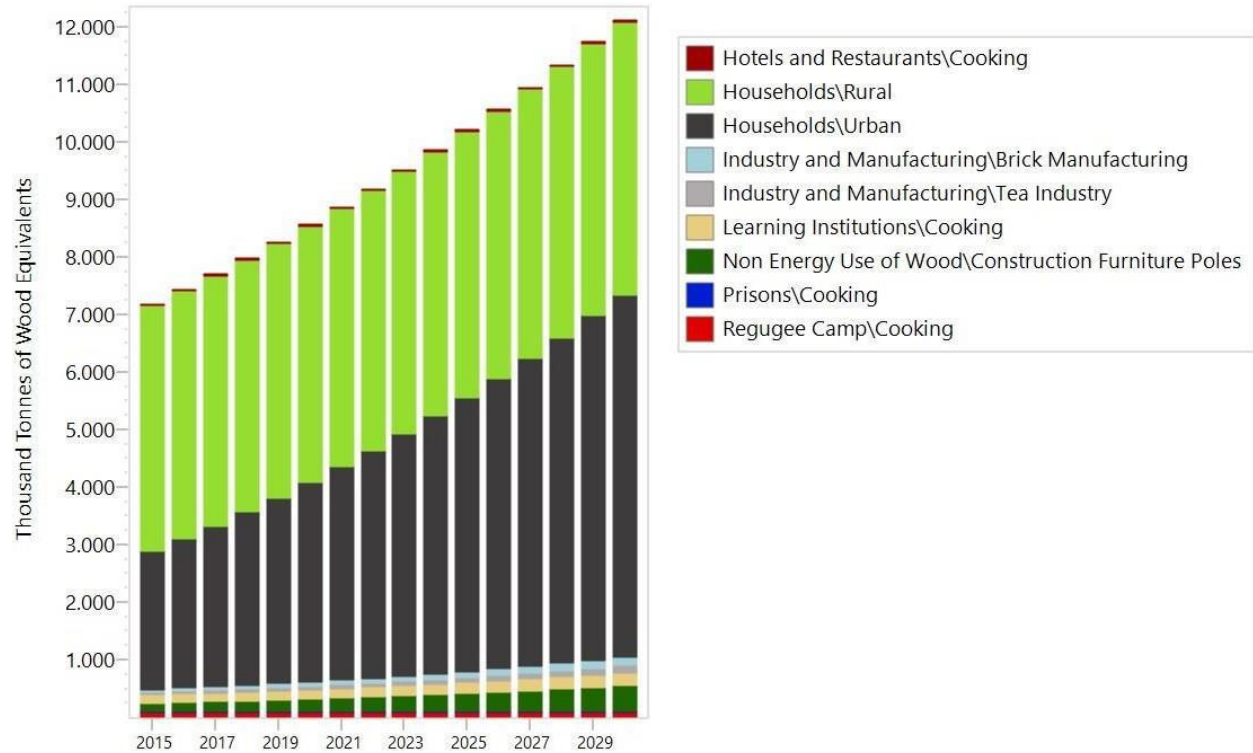
*HW * N: Total household's fuelwood consumption in tons. The tool par. 15 allows to use an aggregated value for consumption per household (HW) times the number of households (N).*

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)

²² <https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-30-v4.0.pdf>

Wood consumption is shown in detail in the Rwanda Biomass Energy Strategy²³.



²³ Ministry of Infrastructure – Rwanda (2019): BEST Rwanda Biomass Energy Strategy.
<https://documents1.worldbank.org/curated/en/109721576903079803/Concept-Project-Information-Documents-PID-Rwanda-Energy-Access-and-Quality-Improvement-Project-P172594.docx#:~:text=In%20October%202019%2C%20MININFRA%20published,to%2042%20percent%20by%202024>

<https://static1.squarespace.com/static/5633c4c2e4b05a5c7831fbb5/t/610c81860069192a6ba0d603/1628210271758/Cukic%2C+Dr.+I.+et+al.+--+Energies+--+National+Bottled+Gas+Strategy+for+SD7+in+Rwanda+28+July+2021.pdf>

APPENDIX 3: JUSTIFICATION OF FNRB CALCULATION

Additional note on fNRB calculation in Rwanda applicable for a project in Rusizi District

In addition to the calculation sheet sent to the VVB for validation of the project VCS4585, paragraph 6 and 13 of TOOL 30 need to be addressed.

Paragraph 13

“If the fNRB value is estimated at the national level, as a cross check, project proponent shall compare the value of estimated NRB with the product of: i) total average above ground biomass tonnage of the area of forest areas deforested in recent past (tons/ha), and ii) most recent available observed annual rate of deforestation (ha/yr). If the estimated NRB value is more than 10% above the value calculated as per the product of biomass and deforestation rate, justification shall be provided for the higher value for NRB.”

We have decided to apply paragraph 13 specifically to the district of Rusizi. We therefore need to calculate 3 values:

- NRB value for Rusizi district
- Annual deforestation rate for Rusizi district
- Total Average above ground biomass tonnage in Rusizi district

i) Calculation of NRB value for Rusizi district

We will use the following equation:

$$NRB (Rusizi) = NRB (Rwanda) * \frac{area\ Rusizi\ (ha)}{area\ Rwanda\ (ha)}$$

Variable	Value	Source
NRB Rwanda	28 484 624 t/year ²⁴	Calculated with tool 30
Area Rusizi	959km ²	Republic of Rwanda
Area Rwanda	26 338 km ²	Republic of Rwanda ²⁵

²⁴ NRB value from the calculation of f_{NRB} in Rwanda. See document 20231018_fNRB_CALCULATION_Rwanda

²⁵

<https://www.gov.rw/about#:~:text=Rwanda%20is%20a%20country%20situated,be%20445%20people%20per%20km%C2%B2.>

NRB Rusizi	1 037 161 t/year	Calculated with equation above
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ii) Calculation of Annual Deforestation rate

We need to calculate observed annual rate of deforestation for Rusizi district with the following equation:

$$\text{Annual deforestation rate} = \frac{\text{Forest area (2010)} - \text{Forest area (2020)}}{(2020 - 2010)}$$

Variable	Value	Source
Forest Area Rusizi (2010)	68 700 ha	Global Forest Watch database (see Extract 1 below)
Forest Area Rusizi (2020)	46 200 ha ²⁶	Global Forest Watch database (see Extract 1 below)
Annual deforestation rate	2 250 ha/year	Calculated with equation right above

Extract 1 from Global Forest Watch



iii) Calculation of above ground biomass tonnage in Rusizi district

$$AGB \text{ biomass tonnage} = AGB \text{ stock in Rwanda} / \text{area}$$

Variable	Value	Source
AGB stock in Rwanda	$73 \times 10^6 \text{ t}$	The carbon footprint of traditional wood fuels, from Nature Climate Change ²⁷
Area Rwanda (from the same source)	211 000ha	The carbon footprint of traditional wood fuels, from Nature Climate Change
Average AGB biomass tonnage	346 t/ha ²⁸	Calculated with equation above

iv) Comparison required by methodology

$$\text{Annual deforestation rate} \left(\frac{\text{ha}}{\text{year}} \right) * \text{avg above ground biomass} \left(\frac{\text{t}}{\text{ha}} \right) =$$

$$2\,250 \left(\frac{\text{ha}}{\text{year}} \right) * 364 \left(\frac{\text{t}}{\text{ha}} \right) = 778\,500 \frac{\text{t}}{\text{year}}$$

The NRB value (~1Mt/year) is more than 10% above the value calculated as per the product of biomass and deforestation rate, which requires an explanation, according to the methodology. This whole paper also underlines the various reasons why the fNRB is higher than default value. More arguments will be listed below.

v) Justifications

Over-generalization of national NRB estimate: the national NRB estimate does not reflect local conditions in Rusizi.

Forest quality and density: Rusizi district has specific conditions (such as intense pressure on biomass or local over-exploitation) that justify a higher fNRB. The biomass density per hectare in specific areas of Rusizi may be underestimated, due to higher-than-average biomass density. The district might contain particularly dense forests or species with high biomass that are not adequately represented in national averages.

²⁷ (i) Bailis, R.; Drigo, R.; Ghilardi, A. & Masera, O. (2015). The carbon footprint of traditional woodfuels. *Nature Climate Change*, 5(3), pp. 266–272.

https://www.researchgate.net/publication/271503594_The_Carbon_Footprint_of_Traditional_Woodfuels

²⁸ <https://ourworldindata.org/grapher/above-ground-biomass-in-forest-per-hectare?tab=chart&time=earliest..latest&country=~RWA>

Pressure on biomass resources: A high demand for firewood in Rusizi could lead to over-exploitation of available biomass. A growing population in the district in the coming years will exert greater pressure on forest resources, driving higher demand for wood energy and accelerating deforestation.

Climate-related degradation: local climatic conditions, such as frequent droughts or other natural disturbances, have started to reduce forest regeneration capacity.

Outdated data: although we used the most recent values to date for every calculation, some data are already a few years old, therefore not taking into account some increased pressure sources (population growth, climate-related degradation, etc.).

Paragraph 6

“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.”

Here are a few values to elaborate on:

- Former CDM default values for fNRB in Rwanda: **98%**²⁹
- New CDM values under debate for fNRB in Rwanda: **59%**³⁰
- FNRB in Rwanda at 98%. (Source: Enea Consulting: Domestic biogas diffusion in Rwanda (2016) evaluates)
- Value calculated: **91%** with an applied uncertainty of **26%**.

Spatial consideration: the value calculated is comprised between the former and the new CDM values for fNRB in Rwanda. However, this is **national average**. In our case the district of Rusizi is located in the Western Province of Rwanda, more rural, where the population rely on fuelwood even more than in the rest of the country (According to *Our World in Data*³¹; the share of deforestation in Rwanda driven by domestic consumption is over 98% in the country). According to *“The Global Footprint of Traditional Woodfuels”*, Rwanda indeed stands among the country with the highest rates of NRB utilization, especially in rural areas. We aimed to calculate the fNRB for the area of the project, therefore in Rusizi district. However, it was impossible to find all the needed values to carry on with this calculation. We expect Rusizi’s fNRB to be much higher than the rest of the country. Indeed, if we were to use Rusizi **land cover proportion** instead of the one used in this document, the fNRB would be higher as the

²⁹ CDM former default values

³⁰ https://cdm.unfccc.int/sunsetcms/storage/contents/stored-file-20231012184345703/MP92_EA07_Information%20Note_fNRB%20values_collated.pdf

³¹ <https://ourworldindata.org/grapher/share-deforestation-domestic-consumption?tab=table>

district is covered by much more natural forests according to Forest Watch, and way less savannahs than the national average.

Uncertainty applied: in addition to this, an uncertainty of 26% is applied to the value we calculated. Overall, $91\% \times (1 - 26\%) = 66\%$. This value is quite close to the new CDM value under debate at national level for Rwanda. The value we used is the one calculated (91%), with the 26% deduction (imposed by the VM0050v1.0 methodology and tool 30). Annex 2 provides information to back the calculation, however, fNRB and deduction applied are as stated in section 5 of the PD.

Forests' location and protection: Moreover, as shown on the map right below, most of the remaining forests are in the Western Province, and specifically in Rusizi. And although afforestation happened in Rusizi, "Agricultural expansion is, by far, the leading land-use change in this Province associated with nearly all deforestation cases." However, crops do not replace natural forests, according to the Rwanda Forest Cover Mapping issued by the government in November 2019³². The same reports also recommend directing planting efforts towards the Western Province given that it is the only a Province with a declining forest area since 2009.

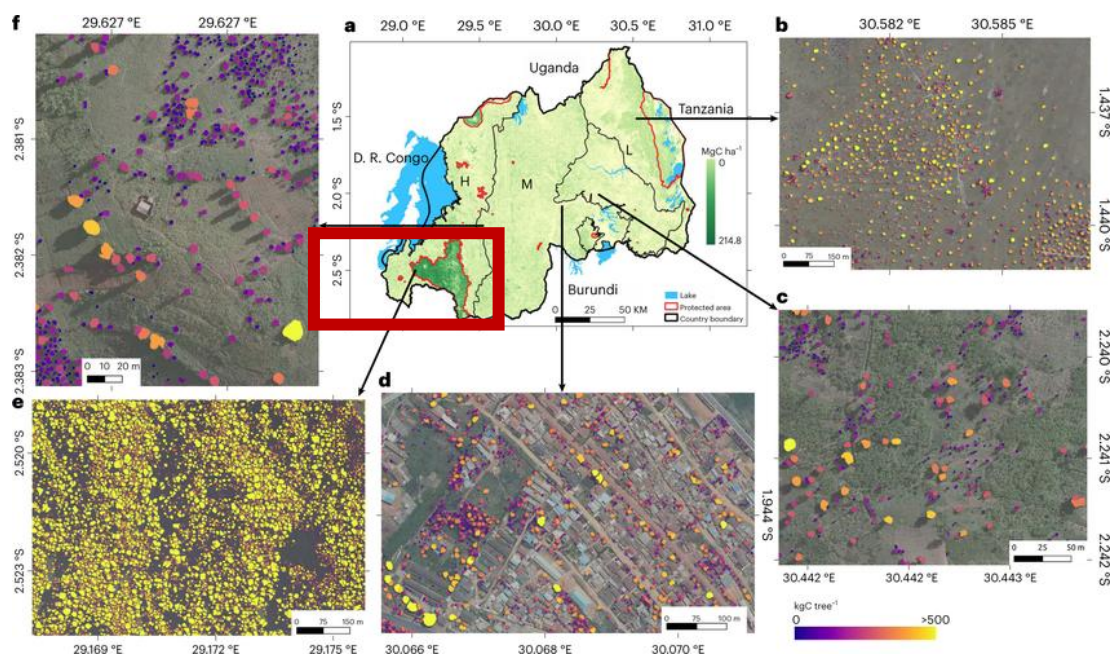
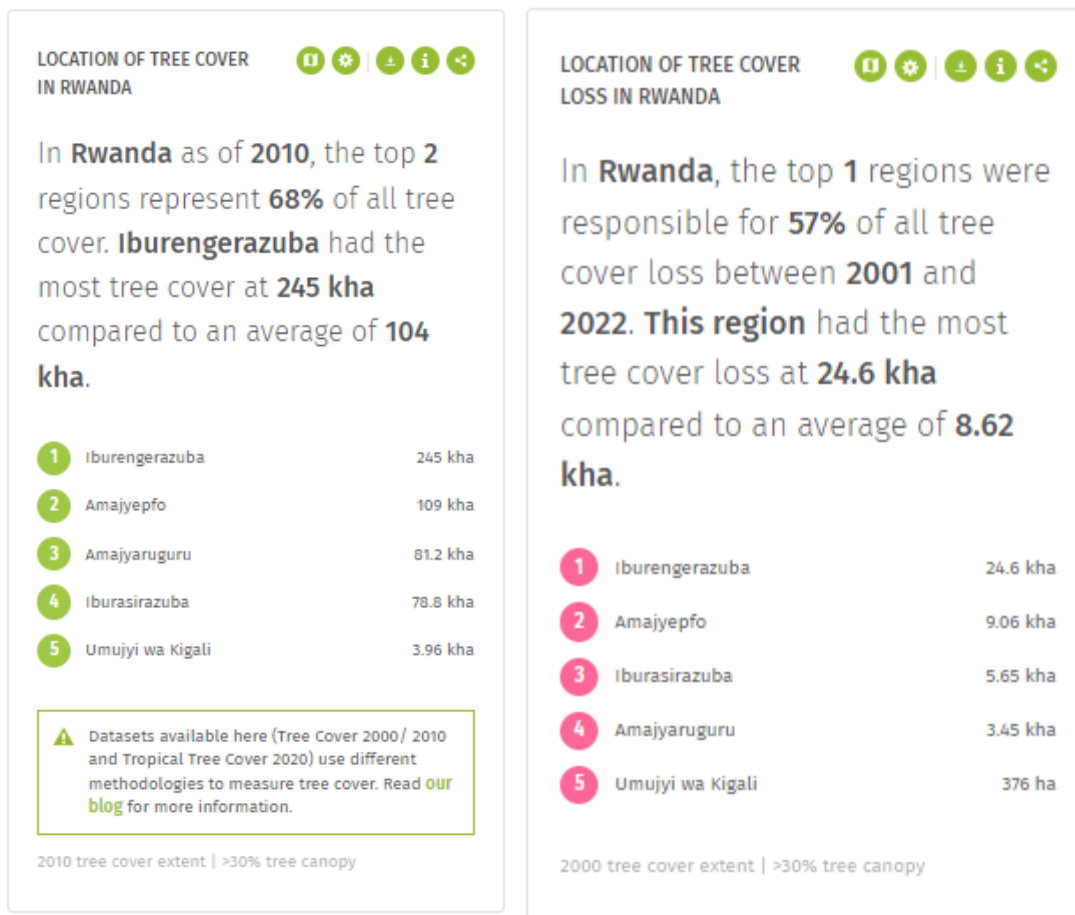


Figure: Repartition of forests area in Rwanda (with Rusizi district circled in red)³³

³² https://www.environment.gov.rw/fileadmin/user_upload/Moe/Publications/Reports/Forest_cover_report_2019.pdf

³³

<https://www.researchgate.net/publication/366522014/figure/fig3/AS:11431281113658048@1674014051590/Aboveground-carbon-stocks-at-tree-level-in-Rwanda-a-Spatial-distribution-of-the.png>



Location of tree cover loss in Rwanda by Region (Rusizi's region is of course on top)³⁴

Population growth: the expected population growth in Rwanda over the lifetime of the project is not considered, although the increasing pressure on the forest shall result from this.

IUCN consideration: Rusizi lake and rivers area is considered by the IUCN (International Union for Conservation of Nature) as a protected area category II. This means the whole area was identified as a place to manage in order to perpetuate, in as natural a state as possible and to maintain viable and ecologically functional populations. This protected area is shared between Rwanda and Burundi. Burundi is the 3rd higher value of fNRB, as explained in the Information note on fNRB values³⁵, once again on a national average.

³⁴ Global Forest Watch

³⁵ https://cdm.unfccc.int/sunsetcms/storage/contents/stored-file-20231012184345703/MP92_EA07_Information%20Note_fNRB%20values_collated.pdf

APPENDIX 4: CARBON MARKET FRAMEWORK IN RWANDA



Republic of Rwanda

**RWANDA ENVIRONMENT
MANAGEMENT AUTHORITY
(REMA)**



• Phase I: Establishment of a Carbon Market Project

Step 1: Application for non objection letter:

Process:

- Fill the Project Idea Note (PIN) template.
- Apply for non objection letter
- The response to be provided within 30 days from REMA after review.

Step 2: Application for letter of approval

Process: 20240908

- Fill the Mitigation Activity Design Document (MADD) template
- Fill the contribution to Sustainable Development (SD) template
- Other relevant documents (e.g: RSB test results for ICS, agreement, MoUs, company registration certificate, etc...)
- The response to be provided within 60 days from REMA

• Phase II: Project implementation

Step 3: Application for issuance letter of ITMOs

Process:

- Project implementation and monitoring
- Hire independent verifier/ auditor
- Submit a verification report
- REMA provides the issuance letter within 60 days after review

Step 4: Application for authorization Letter of ITMOs

Process:

- Apply for authorization
- Submit the issuance letter
- REMA provides the authorization letter within 30 days after review