



**Verified Carbon
Standard**

INSTALLATION OF HIGH EFFICIENCY WOOD BURNING COOKSTOVES IN KENYA



Project title	Installation of high efficiency wood burning cookstoves in Kenya
Project ID	2349 ¹
Monitoring period	01-April-2023 to 31-March-2025 (both days included)
Original date of issue	10-June-2025
Most recent date of issue	29-January-2026
Version	02.2
VCS Standard Version	4.7
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¹ <https://registry.verra.org/app/projectDetail/VCS/2349>

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PROJECT DETAILS

1.1 Summary Description of the Implementation Status of the Project

The project involves distribution and installation of fuel-efficient Improved Cookstoves (ICS) in Kenya. The ICS disseminated through this project replaces the baseline practice of burning wood in rudimentary cookstoves or three-stone fires.

Under this project, two Total Land Care (TLC) Rocket Stoves are deployed in each household. Other comparable ICS model(s) may be added based upon request of the end users. Technical details of the stoves installed have been provided in APPENDIX 2: <TECHNICAL DETAILS>

The project has been implemented in phases, with each household receiving two ICS. At the end of the third monitoring period a total of 119,938 ICS have been distributed in 59,969 households. The details of project ICS installed for each monitoring period is provided in the Table 1 below:

The relevant implementation dates (e.g., dates of construction, commissioning, and continued operation periods).

1 st Monitoring Period	06-October-2020 to 31-August-2021 (both days included)
2 nd Monitoring period	1-September-2021 to 28-February - 2022 (both days included)
3 rd Monitoring period	1-March-2022 to 15-September - 2022 (both days included)
4 th Monitoring period	16-September-2022 to 31-March-2023 (both days included)
5 th Monitoring period	01-April-2023 to 31-March-2025 (both days included)
Date of first ICS distributed	06-October-2020
Date of last ICS installed in fifth MP	30-September-2023
Total no. of ICS in database till end of fifth MP (31-March-2025)	119,938

Table: Details of Project ICS installed for monitoring period.

All the data recorded during stove registration and monitoring survey process was captured via handheld digital devices (smart phones and/or tablets). The information collected is then transferred to a centralized online project database.

The total GHG emission reductions or removals generated in this monitoring period.

The project results in a total emission reduction of 16,591 tCO₂e over the monitoring period of 1-April-2023 to 31-March-2025 (both days included).

1.2 Audit History

Audit type	Period	Program	Validation/verification body name	Number of years
Validation	22-October-2022	VCS	Carbon Check (India) Private Ltd	N/A
verification	06-October-2020 to 31-August-2021(both days included)	VCS	Carbon Check (India) Private Ltd	0.90 years
Verification	01-September-2021 to 28-February-2022(both days included)	VCS	VKU Certification Pvt. Ltd.	0.50 years
Verification	02-March-2022 to 15-September-2022(both days included)	VCS	VKU Certification Pvt. Ltd.	0.54 years
Verification	16-September-2022 to 31-March-2023(both days included)	VCS	VKU Certification Pvt. Ltd.	0.54 years
Verification	01-April-2023 to 31-March-2025(both days included)	VCS	SustainCERT	2 years

1.3 Sectoral Scope and Project Type

Sectoral scope ²	03: Energy demand
Project activity type	Type: II – Energy efficiency improvement projects

1.4 Project Proponent

Organization name	Bridge Carbon Africa Stoves Development Private Limited
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² 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>.

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1.5 Other Entities Involved in the Project

Bridge Carbon Africa Stoves Development Private Limited is the sole entity involved in the project and no other entity is part of the grouped project activity.

Organization name	NA
Role in the project	NA
Contact person	NA
Title	NA
Address	NA
Telephone	NA
Email	NA

1.6 Project Start Date

Project start date	06-October-2020
Justification	As per VCS Standard version 4.7 section 3.8 “The project start date of a non-AFOLU project is the date on which the project began generating GHG emission reductions or carbon dioxide removals”, Hence the date of commissioning of first ICS under the grouped project activity 06-October-2020 is the start date.

1.7 Project Crediting Period

Crediting period	☐ Seven years, twice renewable
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	☒ <i>Ten years, fixed</i> ☐ <i>Other (state the selected crediting period and justify how it conforms with the VCS Program requirements)</i>
Start and end date of first or fixed crediting period	06-October-2020 to 05-October-2030

1.8 Project Location

The project location is the geographical boundary of Republic of Kenya with coordinates 0°1'24.8" S latitude and 37°54.372' E longitude³



Kenya map⁴

³ <https://www.geodatos.net/en/coordinates/kenya>

⁴ <http://www.mapsopen-source.com/kenya-provinces-map.html>

1.9 Title and Reference of Methodology

Type (methodology, tool or module).	Reference ID, if applicable	Title	Version
Methodology	VM0050 ⁵	Energy Efficiency and Fuel-Switch Measures in Cookstoves ⁶	1.0
Tool	Tool 33 ⁷	Default values for common parameters	03.0

1.10 Double Counting and Participation under Other GHG Programs

1.10.1 No Double Issuance

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

☐ Yes ☒ No

1.10.2 Registration in Other GHG Programs

Was the project registered or seeking registration under any other GHG programs?

☐ Yes ☒ No

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

1.11.1 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

⁵ <https://verra.org/wp-content/uploads/2024/10/VM0050-EE-and-Fuel-Switch-Measures-in-Cookstoves-v1.0.pdf>

⁶ PP has sought the methodology deviation due to the inactivation of applied methodology "VMR0006 Energy Efficiency and Fuel Switch Measures in Thermal Applications" which has replaced by "VM0050 Energy Efficiency and Fuel-switch measures in Cookstoves, Version 1.0" on 09-October-2024.

⁷ <https://cdm.unfccc.int/methodologies/PAMethodologies/tools/am-tool-33-v3.pdf>

1.11.2 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

1.11.3 Supply Chain (Scope 3) Emissions

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

☐ Yes ☒ No

If yes:

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

☐ Yes ☒ No

If yes:

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

☐ Yes ☒ No

If yes to all:

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

1.12 Sustainable Development Contributions

Before the implementation of the project, households in the project location used non-renewable biomass for cooking in rudimentary cookstoves or three-stone fire. The project distributes fuel-efficient ICS to replace baseline cookstoves in households in Kenya, reducing firewood consumption and personal exposure to indoor air pollution. People, primarily women and children, spend less time collecting firewood, reducing drudgery. The implementation and construction of ICS have provided job opportunities to local people, increasing incomes. The project reduces forest degradation and GHG emissions as well. The description of how the project activity resulted in the SD contributions provided with the SDG indicator and its impact for the monitoring period in Table 2 below.

Table 2: Sustainable Development Contributions

Row number	SDG target	SDG indicator	Net impact on SDG indicator	Current project contributions	Contributions over project lifetime
Sequential row number	SDG Target number	Number and text of SDG indicator or, if no official SDG indicator is applicable, user-defined indicator	Indicate the project's contribution to the SDG Indicator (implemented activities to increase or decrease)	Brief description of the quantifiable impact of the project's activities related to the SDG indicator, during the monitoring period.	Brief description of the cumulative quantifiable impact of the project's activities related to the SDG indicator, over the project lifetime.
1	7.1	7.1.2 Proportion of population with primary reliance on clean fuels and technology	Increase	Increase access to clean cooking technology with ICS installations in 59,969 households during current monitoring period.	Increase access to clean cooking technology with ICS installations in 59,969 households since first ICS distribution.
2	13.0	Project Specific Indicator: Reduction in GHG emissions as compared to the baseline scenario (three stone fire)	Decrease	Contributing to GHG emission reduction of 16,591 tCO ₂ e into the atmosphere in the current monitoring period.	294,059 tCO ₂ e of GHG emissions reductions till end of monitoring period date (31-March-2025) since project start date.

3	15.2	15.2.1 Progress towards sustainable forest management by increasing above-ground biomass in forests	Implemented activities to increase	For the current monitoring period, the project has saved 7,740 tonnes of non-renewable biomass.	Contribute to the reduction of forest degradation through reduced consumption of 189,807 tonnes of non-renewable biomass since the project start date.
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1.13 Commercially Sensitive Information

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

2 SAFEGUARDS AND STAKEHOLDER ENGAGEMENT

2.1 Stakeholder Engagement and Consultation

2.1.1 Stakeholder Identification

The Stakeholder makeup has not changed since validation. The PP conducted a comprehensive stakeholder consultation as described in section 2.2 of project VCS PD

Stakeholder Identification	Stakeholder identification is a continuous process aimed at verifying the necessity of engaging other entities interested and/or impacted by the project activities. Stakeholders can be directly impacted by the activities (beneficiary households) or interested in the project implementation due to their role in the communities and Country.
Legal or customary tenure/access rights	The implementation and construction of improved cookstoves does not require any kind of customary tenure/access rights since the project activity is based only on the dissemination of the cookstoves to local communities.
Stakeholder diversity and changes over time	Among the beneficiary households, no clear differences on social, economic, and cultural aspects have been detected, while the stakeholders indirectly involved in the project show different social and economic levels.
Expected changes in well-being	The most relevant expected improvements on stakeholder well-being are- 1. reduced household air pollution, reducing the risk of disease,

	2. decreased perceived risk of gender-based violence and decreased risk of injury from carrying heavy loads for household members who collect fuelwood, 3. increased savings on fuel cost (less fuel purchased), and 4. time saving (less fuel collected).
Location of stakeholders	All stakeholders are operating and living in the project area, which is in the geographical boundary of Kenya. Further, this grouped project activity does not require relocation of any stakeholder, indigenous people, or local communities. The project does not lead to any negative impact outside the project boundary.
Location of resources	The project activity involves the implementation and construction of ICS to beneficiary households and resources owned by the stakeholders are not impacted by the project.

2.1.2 Stakeholder Consultation and Ongoing Communication

Ongoing consultation	The PP follows three methods for continuous feedback and ongoing communications with stakeholders during project implementation. These are: Annual Stove Champion visits and Performance Check visits to households – Staff from Bridge Carbon’s in-country team visits each registered household (ICS user) at least once per year. Usually, this stove champion visit is conducted within four months from the date of installation/registration. The objective of this visit is to ensure that project cookstoves are being properly used and to educate women on cookstoves maintenance, best practices, and benefits. The end user can use these visits to register complaints. In addition, the Bridge Carbon country team (leadership team, PSO, etc.) conducts performance check visits to registered households on a sample basis. One of the objectives of these visits is to ensure that the ground team is adequately addressing concerns from the beneficiaries and the end users are trained on the operation and maintenance of cookstoves and are aware of the benefits of the ICS. This performance
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	check visit also addresses end user grievances and provides maintenance to cookstoves as needed. Call over helpline number - End Users can report their grievances and complaints regarding maintenance and/or malfunctioning of their stove or any of its parts, or any other issues by calling the helpline number. Bridge Carbon's ground team addresses grievances, failing which the Bridge Carbon country manager can pursue remedial action. Through village chief/community leader/stove champion – In view of the cultural obligations and individual level inhibitions, a provision has been made for end users to approach Bridge Carbon team through their village chief/community leader/stove champion with whom they might be more comfortable. The village chief/community leader/stove champion then channels the concern/issue to Bridge Carbon staff for resolution. This is undertaken to protect traditional sentiments and value systems of the villages and ensure end users can express issues or concerns without hesitation. As a part of on-going communication with all category stakeholders, it was explained during the LSC meeting that they are free to voice grievances regarding the project activity. Stakeholders are free to connect with the respective Bridge Carbon team anytime through e-mail or contact number provided by PP. Any relevant concern received during the operation of project activity will be addressed according to its merit.
Date(s) of stakeholder consultation	26-October-2020 and 25-November-2020
Communication of monitored results	The monitoring results are communicated time to time to local authorities (e.g., Village Chief, Commune Councils and Govt officials etc.) based on the relevance of comments.
Consultation records	Stakeholders were invited to provide feedback via multiple methods including, an announcement posted on PP website on 26-October-2020, with an electronic feedback form, Project Description Presentation, and Non-Technical Summary. Furthermore, an English advert ran in The Daily Nation, a major national newspaper, on 14-November-2020;

	and e-mail invitations were sent from PP on 4-November-2020, to 54 people from organizations around the country including government, NGOs, stove manufacturers, project developers, academia and private and public-sector entities involved with cookstoves and/or sustainable energy. The email included a link to the PP website announcement and feedback form which resulted in electronic commentary from five additional stakeholders.
Stakeholder input	The PP has taken account of all the inputs received from the stakeholders during the consultation period. 1. User feedback in addition to monitoring parameters included in our project design documents will be collected during our monitoring processes. This is common practice for our projects, and 2. The project implementors will include stove types/technologies that they have already tested in the market and stove/fuel benefits and performance characteristics will be accurately presented to end-users. Comments received from stakeholders required no changes/updates to the project design.

2.1.3 Free, Prior, and Informed Consent

Consent	The participation of households in the project is free and voluntary. During stakeholder meetings it is highlighted that there is no enforcement or obligation to participate. Before delivering an ICS to an interested household, an End User Agreement is signed by a family member declaring that he/she is voluntarily taking part in the project activity. The project does not interfere with Indigenous People and Local Communities' rights.
Outcome of FPIC	The outputs of the stakeholder meetings shared in the section above clearly demonstrate that participants fully understand that their participation in the project is voluntary and that they are free to either take part in the project or decline participation. Indeed, no clarifications were requested in the household engagement procedure.

2.1.4 Grievance Redress Procedure

Grievances received	Resolution and outcome
The stoves had collapsed	The stove was repaired and the client trained on how to do repairs to the stove
Stove had cracks and needed repairs	The stove was repaired and the client trained on how to do repairs to the stove
One stove had broken and needed repairs	The stove was reinstalled and the client trained on how to rebuild and repair the stove
Stove had cracks and needed repairs	The stove was repaired and the client trained on how to do repairs to the stove
One stove had cracks that need immediate repair	The stove was repaired, client retrained on how to repair the stove
Both stoves had cracks and needed to be repaired	Both stoves were repaired and training offered to the client on how to complete repairs in future
One stove had collapsed and needed a reinstallation	Stove was reinstalled, client was retrained on how to repair and reinstall the stove
Stove that cracks and needed repairs	The stove was repaired and the client trained on how to do repairs to the stove

These grievances were resolved by following one of the grievance redressal methods mentioned in the MR, i.e., approach through village chief/call over helpline number/community leader.

Grievance redressal records, such as evidence of the complaint registration form, response summary form, and grievance register detailing the timely redressal of the grievances have been provided to the verifying VVB for assessment.

The grievance mechanism process is illustrated below:

The following figure presents a pictorial representation of the approach adopted to address any grievances and feedback provided by the end-users receiving the improved cookstoves (project stoves) under this grouped project in Kenya:

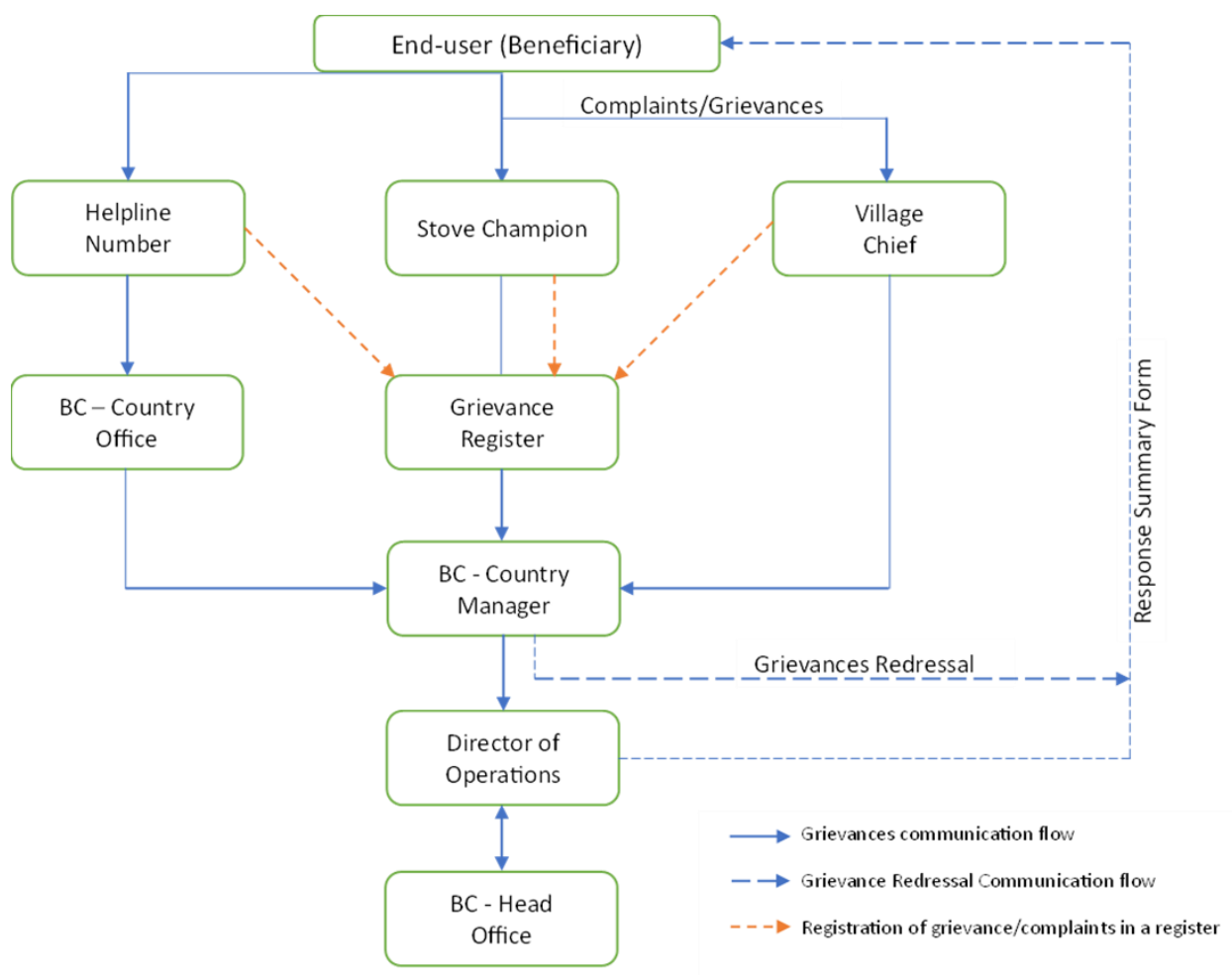


Figure: Modes for on-going communication with local stakeholders under VCS 2349

In order to ensure that grievances are addressed within the prescribed time norms, the levels of responsibility along with timeline is defined for redress of each category of grievances. In case a grievance cannot be redressed at a particular defined level then it is reported to the next higher authority. The table below presents the time norms along with level of responsibility.

Grievance type	Timeline for redress at the level of country office / country manager	Timeline for redress at the level of Director of Operations (SEA)	Timeline for redress at the level of Head office
Maintenance related, inability to use the stove, missing/broken/damaged stove parts/stoves	5 days*	3 days	NA
Complaints against BC; pre-distribution,	One week	One week	One week

distribution, and post distribution related or any other complex concerns			
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*Spare parts need to be provided to the household while the team addresses the fault

2.1.5 Public Comments

The following public comment was received during the 30-day listing period on VERRA registry 28-October-2020 to 27-November-2020.

Summary of comments received	Actions taken
This project does not qualify for carbon credits as the cook stoves are mere already existing tritonal cook stoves having not much efficient. They simply fools the HH user by adding few metallic parts.	Efficiency of the TLC rocket stove has been tested and approved by Aprovecho Research Center. Aprovecho Research Center specializes in testing biomass cooking stoves. They test stoves to understand how they function, to compare stoves, and to improve performance. The Water Boiling Test (WBT) and the nine metrics in the ISO/IWA Tiers provide the project manager with a holistic picture of emissions, fuel use, and safety. Aprovecho Research Center (ARC) assists developing world organizations to establish high quality labs so they can test and improve their wood burning cooking stoves. It specializes in iterative experimental design of wood burning cookstoves through rapid prototyping and emissions and thermal measurements.

2.2 Risks to Stakeholders and the Environment

2.2.1 Management Experience

Bridge Carbon (BC) is carbon project developer empowering vulnerable communities across sub-Saharan Africa and Southeast Asia to address climate change and drive sustainable development, through access to clean cooking, renewable energy, and ecosystem restoration solutions.

BC has a well-structured implementation team in place to conduct project activities. Bridge Carbon has numerous active projects under VERRA (VCS/SD Vista).

The management of BC are committed to developing high quality greenhouse gas emission reduction projects by providing fuel-efficient improved cookstoves to people in Kenya through

carbon finance. BC brings world-class expertise in carbon management, operations, legal, and finance, and is committed to delivering carbon projects that deliver exceptional quality, integrity, and transparency.

2.2.2 Risk assessment

	Risk identified	Mitigation or preventative measure(s) taken
Natural and human-induced risks to stakeholders' wellbeing	No risk identified.	The project ICS has been designed to emit minimal amounts of smoke, avoiding fire hazards from malfunctions and significantly reducing fuelwood consumption to indirectly combat forest degradation. Additionally, the PP ensures that the end users receive adequate training in handling the ICS, mitigating risks to stakeholders' wellbeing.
Risks to stakeholder participation	No risk identified.	There are no exclusions, lack of communication, or barriers in the project activity that might prevent stakeholders from engaging or participating.
Working conditions	No risk identified.	The ICS provides a safer cooking alternative compared to traditional cookstoves. Additionally, comprehensive training sessions on ICS usage are conducted for stakeholders to minimize potential risks.
Safety of women and girls	No risk identified.	In rural Kenya women and girls are mainly responsible for fuelwood collection. The reduction in fuelwood consumption with ICS reduces the time spent on fuelwood collection and potentially reduces the risk of gender-based violence.
Safety of minority and marginalized groups, including children	No risk identified.	The project activity does not negatively affect the safety of minority and marginalized groups, including children.
Pollutants (air, noise, discharges to water, generation of waste, and release of hazardous materials and chemical pesticides and fertilizers)	No risk identified	Due to project activity, there is reduced risk from air pollutants and no risk of noise, discharges to water, generation of waste, or release of hazardous materials, chemical pesticides or fertilizers. The residual ash of burned firewood from cooking is eventually used to fertilize nearby soil.

2.3 Respect for Human Rights and Equity

2.3.1 Labor and Work

	Risks identified ⁸	Mitigation or preventative measure(s) taken
Discrimination	No risk identified	The PP firmly condemns every form of discrimination based on gender, religion, or cultural differences. PP has implemented comprehensive policies and provided training to prevent and promptly address such issues. PP follows Part II – General Principles, – “Discrimination in employment” Section 5 (1,2,3) of “The Employment Act 2007 ⁹ ” of Kenya
Sexual harassment	No risk identified	The PP has an established grievance mechanism system for staff and a “speak up” hotline they can call or email. The staff have been trained about harassment prevention and reporting. PP follows Part II – General Principles, – “Sexual harassment” Section 6 (1,2,3,4) of “The Employment Act 2007 ¹⁰ ” of Kenya
Gender equity in labor and work	No risk identified	Bridge Carbon provides equal opportunities to people of all genders. Any kind of gender-based discrimination is strictly forbidden. PP follows Part II – General Principles, – “Discrimination in employment” Section 5 (3) of “The Employment Act 2007 ¹¹ ” of Kenya
Forced labor	No risk identified	No forced labor is involved in the project activity. PP follows Part II – General Principles, – “Prohibition against forced labour.” Section 4 of “The Employment Act 2007 ¹² ” of Kenya

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

⁹ https://www.labour.go.ke/sites/default/files/law/The_Employment_Act_2007.pdf

¹⁰ https://www.labour.go.ke/sites/default/files/law/The_Employment_Act_2007.pdf

¹¹ https://www.labour.go.ke/sites/default/files/law/The_Employment_Act_2007.pdf

¹² https://www.labour.go.ke/sites/default/files/law/The_Employment_Act_2007.pdf

Child labor	No risk identified	No child labor is involved in the project activity. PP follows Part VIII – Protection of Children, – “Prohibition of worst forms of child labour.” Section 53 of “The Employment Act 2007 ¹³ ” of Kenya
Human trafficking	No risk identified	No human trafficking is involved in the project activity. PP follows Part II – General Principles, – “Prohibition against forced labour.” Section 4 of “The Employment Act 2007 ¹⁴ ” of Kenya

2.3.2 Human Rights

Risks identified	Mitigation or preventative measure(s) taken
No risk identified	The project activity is implementing ICS to beneficiaries free of charge (i.e., zero cost). Beneficiaries who received project ICS sign an agreement for their voluntary participation in the project activity. The project continues to recognize, respect, and promote the protection of the rights of the local community. The dissemination of the improved cookstove does not require any kind of customary tenure/access rights since the project activity is based only on the dissemination of the cookstoves to local communities. The PP ensure the application of all applicable laws, regulation, and international standards, including the Universal Declaration of Human Rights¹⁵, United Nation Declaration on the Rights of Indigenous Peoples¹⁶ (UNDRIP) and ILO Conventions are adhered to. The project activity does not interfere in any case with Indigenous People and Local Communities’ rights.

2.3.3 Indigenous Peoples and Cultural Heritage

Risks identified	Mitigation(s) or preventative measure taken
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¹³ https://www.labour.go.ke/sites/default/files/law/The_Employment_Act_2007.pdf

¹⁴ https://www.labour.go.ke/sites/default/files/law/The_Employment_Act_2007.pdf

¹⁵ <https://www.ohchr.org/sites/default/files/Documents/Publications/fs9Rev.2.pdf>

¹⁶ https://www.un.org/development/desa/indigenouspeoples/wp-content/uploads/sites/19/2018/11/UNDRIP_E_web.pdf

No risk identified	The project activity involves the implementation and construction of ICS to beneficiary's households; therefore, no tangible cultural heritage has been hampered by the project activity. Also, there have been no negative impacts of the project activity on the non-tangible cultural heritage of the stakeholders. Hence, the project continues to preserve and protect cultural heritage.
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2.3.4 Property Rights

Risks identified	Mitigation or preventative measure(s) taken
No risk identified	This project involves the implementation and construction of ICS in beneficiary household and resources owned by stakeholders are not impacted by the project. Hence, no land/property of the stakeholders, IPs, LCs, and customary rights holders have been impacted by this project activity. Additionally, the project activity has obtained the free, prior and informed consent of the end users (beneficiaries including the IPs, LCs, and customary rights holders). This ensures that their land and property rights are protected and respected.

2.3.5 Benefit Sharing

Summary of the benefit sharing plan	The benefit sharing plan is not applicable as project activity does not incur any risk related to property rights as explained in the previous section. Additionally, the project activity is completely based on implementation and construction of two ICS to each household where ICS are free of cost. If an ICS breaks, the PP will fix or replace the ICS. The ownership rights of carbon credit generated from this project are with Bridge Carbon. Bridge Carbon has signed end-user agreement with beneficiaries mentioning all the criteria before implementation of the project devices for entire crediting period.
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Benefit sharing during the monitoring period	Not Applicable.
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2.4 Ecosystem Health

	Risk identified	Mitigation or preventative measure(s) taken during the monitoring period
Impacts on biodiversity and ecosystems	No risk identified	As the ICS consumes less firewood than baseline cooking technologies, it helps to reduce forest degradation. This reduction in demand for fuelwood allows forests to regenerate, protecting wildlife habitats and biodiversity.
Soil degradation and soil erosion	No risk identified	The ICS reduces the requirement for woody biomass, which means that less woody biomass is consumed for cooking. This decrease in reduces forest degradation, raising the amount of above-ground biomass in the nearby woods. Reduction in unsustainable harvesting of plant biomass could further reduce soil erosion associated with tree felling and improve biodiversity and species richness of the implementation area
Water consumption and stress	No risk identified	This grouped project activity involves implementation and construction of ICS and does not have any negative impacts on water consumption and does not lead to water stress in any way. Hence, this is not applicable.

2.4.1 Rare, Threatened, and Endangered species

Species or habitat	Since the project activity involves the implementation and construction of ICS, which is not located in or adjacent to habitats for rare, threatened, or endangered species; hence, this is not applicable
Areas needed for habitat connectivity	Since the project activity involves the implementation and construction of ICS, which is not located in or adjacent to habitats for rare, threatened, or endangered species; hence, this is not applicable

	Risks identified	Mitigation or preventative measure(s) taken
Habitats for rare, threatened, and endangered species	No risk identified	The project activity involves the implementation and construction of ICS to people in rural areas of Kenya, which is not located in or adjacent to the areas needed for habitats for rare, threatened, and endangered species connectivity. Therefore, there are no risks associated with habitats for rare, threatened, and endangered species.
Areas for habitat connectivity	No risk identified	The project activity involves the implementation and construction of ICS to people in rural areas of Kenya, which is not located in or adjacent to the areas needed for habitats for rare, threatened, and endangered species connectivity. Hence, this is not applicable.

2.4.2 Introduction of species

Species introduced	Classification	Justification for use	Adverse effects and mitigation
We are not introducing any live species, so there is no risk of introducing invasive species.	N/A	N/A	N/A

Existing invasive species	Mitigation measures to prevent the spread or continued existence of invasive species
Not applicable, the project activity is not related to planting or species introduction	N/A

	Risks identified	Mitigation or preventative measure(s) taken
Invasive species	No risk identified	No invasive species exist in the project area; therefore, there are no risks identified with the project activity.

2.4.3 Ecosystem conversion

As the project activity is not an ARR, ALM, WRC or ACoGS projects hence there is no ecosystem conversion took place in implementing the project activity.

	Risks identified	Mitigation or preventative measure(s) taken
Ecosystem conversion	No risk identified	The project activity is neither ARR, ALM, WRC nor ACoGS; therefore, no risks associated with ecosystem conversion are identified with the project activity.

3 IMPLEMENTATION STATUS

3.1 Implementation Status of the Project Activity

Under this project, two Total Land Care (TLC) Rocket Stoves are deployed in each household. Till the end of current monitoring period (31-March-2025)¹⁷ 119,938 stoves have been distributed to 59,969 households in Kenya.

During the current monitoring period, no incident or event occurred, that could affect GHG emissions reduction and the approved monitoring plan.

3.2 Deviations

3.2.1 Methodology Deviations

Not applicable.

3.2.2 Project Description Deviations

Deviation 3:

The PP has sought a project description deviation due to the inactivation of applied methodology “VMR0006 Energy Efficiency and Fuel Switch Measures in Thermal Applications”¹⁸ which has replaced by VM0050 “Energy Efficiency and Fuel-switch measures in Cookstoves”, v1.0¹⁹ on 09-October-2024.

The details of deviation due to the inactive of methodology has been updated in Appendix 2 “Project Description Deviation” of revised VCS PD (Version 05.2) and describe below:

¹⁷ The last stove deployed during current monitoring period on 30-September-2023.

¹⁸ <https://verra.org/methodologies/vmr0006-methodology-for-installation-of-high-efficiency-firewood-cookstoves/>

¹⁹ <https://verra.org/wp-content/uploads/2024/10/VM0050-EE-and-Fuel-Switch-Measures-in-Cookstoves-v1.0.pdf>

1. PP confirms that project has all data to apply the new methodology as per Procedure to Change Methodology through a Project Description Deviation, v 4.0 dated 16-October-2024. The same has been provided in section 4.1 and 4.2 of VCS MR for respective data parameters tables.
2. Applicability Conditions of methodology has been updated as per VM0050, v1.0 in section 3.2 “Applicability of Methodology” of VCS PD.
3. GHG Emission reduction calculation has been updated as per “VM0050, v1.0” in section 4 “Quantification of Estimated GHG Emission Reductions and Removals” of VCS PD.
4. Data and parameters available at the time of validation has been updated as per “VM0050 (v1.0)” in section 5.1 “Data and Parameters Available at Validation” of VCS PD.
5. PP has applied Ex-ante f_{NRB} value in line with updated VM0050 methodology source 3 “Default value of the most recent version of CDM TOOL33”.
6. Data and parameters monitored has been updated as per “VM0050 (v1.0)” in section 5.2 “Data and Parameters Monitored” of VCS PD.
7. Correction in monitoring plan has been made in section 5.3 “Monitoring Plan” of VCS PD.
8. Bridge Carbon Africa Stoves Development Private Limited is the project entity and project ownership rights will be with Bridge Carbon Africa Stoves Development Private Limited.
9. The PP may include other ICS model(s) in the project with similar or better efficiency. Details of the stoves will be included during the respective monitoring period and supporting documents will be provided during verification.
10. PP has updated the TLC Rocket stove diagram for better clarity about the stove parts in section 1.12 “Description of the Project Activity” of VCS PD.

There is no impact on additionality of the project activity. PP has demonstrated the additionality of the project activity by Step 1: Regulatory surplus, Step 2: Positive list (activity method). Thus, there is no impact on additionality of the project activity by the project description deviation.

The deviation does not negatively impact the conservativeness of the quantification of GHG emission reductions or carbon dioxide removals.

Deviation 2: (Deviation taken during monitoring period 01-March-2022 to 15-September-2022)

The PP has taken deviation during the 3rd MP verification (01-March-2022 to 15-September-2022). Since 11-January-2023, project ownership rights transferred to C-Quest Capital SGS Stoves Private Limited. The relevant document (Deed of accession and Deed of Partial Release in respect of VCS registration deed of representation, both dated 11-January-2023 and communications agreement dated 24-September-2022 for transferring the ownership to VCS has been provided. Verra has approved this deviation, and it has been published on the project page²⁰.

²⁰ <https://registry.verra.org/app/projectDetail/VCS/2349>

Deviation 1: (Deviation taken during monitoring period 06-October-2020 to 31-August-2021)

In section 3.5 of registered VCS-PD, other than the regulatory surplus and positive list, another step called project method has been added. NPV analysis steps are being added in the revised VCS-PD to confirm the additionality of each project activity instance, where the PP has other sources of revenue except carbon credit sales.

The PP has taken a deviation during 1st MP verification (06-October-2020 to 31-August-2021) because in certain villages of Kenya, Implementing Partner has charged a nominal amount for the readymade bricks used for building the stove (for around 2000 ICS). This happened due to the shortage of raw materials like clay and cow dung in that village/ HH vicinity. These raw materials had to be arranged from other locations by implementing partners at additional cost. Other than these 2000 stoves, the Project Implementer/Project Proponent installed all the stoves at zero cost, and PP does not plan on charging the end users any amount. PP has replaced the IP that charged the amount with another IP, ensuring that distribution/installation will remain free of cost.

PP calculated the NPV of the project and provided a detailed investment analysis spreadsheet to VVB during the first verification. Also, the implementation cost and project revenue are mentioned in detail in section 3.5 of the VCS PD.

The proposed changes do not have any impact on applicability of methodology, appropriateness of the baseline scenario, or estimation of emission reductions.

3.3 Grouped Projects

For the inclusion of new project activity instances, the project proponent shall ensure that it meets the eligibility criteria below.

Sr. No.	Criterion	Compliance Requirement	How the new project activity instances to comply
1.	Meets the applicability conditions set out in the methodology applied to the project.	The project activity instance shall use VCS approved methodology – VM0050: “Energy Efficiency and Fuel-Switch Measures in Cookstoves”, version 1.0 and shall meet the applicability conditions set out in the methodology.	Details of how the project activity meets the applicability conditions as per section 4 “Applicability Conditions” of VM0050 methodology are defined in section 3.2 of VCS PD.
2.	Use the technologies or measures specified in the project description.	Project activity deploys improved cookstoves (ICS) in households by replacing traditional cookstove with an initial thermal efficiency of at least 25%.	The manufacturer's specifications shall be used for establishing minimum efficiency criteria in the first year of stove installation.
3.	Apply the technologies or measures in the	The ICSs will substitute the inefficient cooking techniques that are still	The ICS has higher efficiency and better emissions parameters than

Sr. No.	Criterion	Compliance Requirement	How the new project activity instances to comply
	same manner as specified in the project description.	adopted by the local communities. During the ICS delivery, information regarding biomass use as fuel and cooking baseline appliances will be collected and stored in a data management system in order to facilitate the following validation and verification processes.	the baseline scenario. Evidence: Manufacturer's specifications
4.	Are subject to the baseline scenario determined in the project description for the specified project activity and geographic area.	All new project activity instances will be installed within Kenya only and the baseline scenario is the continued use of non-renewable wood fuel by the target population to meet similar thermal energy needs as provided by project cookstoves in absence of project activity. This also conforms to the applied methodology.	The project has the same baseline scenario defined in section 3.4 of this document, i.e., using baseline practice of burning wood in rudimentary cookstoves or three-stone fires in different regions of Kenya.
5.	Have characteristics with respect to additionality that are consistent with the initial instances for the specified project activity and geographic area. For example, the new project activity instances have financial, technical and/or other parameters (such as the size/scale of the instances) consistent with the initial instances, or face the same investment, technological and/or other barriers as the initial instances.	Each project activity instance shall demonstrate its compliance with- Step 1: Regulatory Surplus - There is no mandated government programme or policy in the host country of this project ensuring the implementation and construction of new project activity instances. Step 2: Positive List -	Step 1: There is no mandated government programme or policy in Kenya ensuring the implementation and construction of domestic fuel efficient cookstoves. The project is not mandated by any law, statute, or other regulatory framework, or for UNFCCC non-Annex I countries, any systematically enforced law, statute, or other regulatory framework. Step 2: Project activity satisfies criterion 1 and 2 of positive list. As the project fulfils the conditions under regulatory surplus & positive list, hence, it is deemed additional. C. Project Method The financial indicator against which the project activity instances will demonstrate investment barrier, shall be Net present value (NPV). A specific project activity instance for which NPV is negative without VER revenue shall be deemed additional. Evidence of all costs/revenue in case the implementation has started, else reference of expected

Sr. No.	Criterion	Compliance Requirement	How the new project activity instances to comply
		The project activity introduces: 1) Efficient biomass-fired cookstoves that replace inefficient biomass-fired cookstoves; a. Efficient, solely renewable biomass-fired cookstoves that replace fossil fuel-fired cookstoves; or b. Electric cookstoves that replace inefficient biomass-fired or fossil fuel-fired cookstoves. 2) The project activity installs or distributes improved cookstoves at zero cost to the end user and has no revenue source other than from the sale of verified carbon units (VCUs). Step 3: Project Method - If the project activity is not on the positive list (Step 2), additionality must be demonstrated by applying a barrier analysis or investment analysis as per the most recent version of VT0008.	costs/revenue from earlier investment in similar projects. The project activity is additional and is described in section 3.5 of VCS PD.

3.4 Baseline Reassessment

Did the project undergo baseline reassessment during the monitoring period?

☐ Yes

☒ No

4 DATA AND PARAMETERS

4.1 Data and Parameters Available at Validation

Data / Parameter	NCV _{b,i} NCV _{p,j}
Data unit	TJ/tonne
Description	Net calorific value of baseline fuel used by baseline device type i Net calorific value of project fuel used by project device type j
Source of data	2006 IPCC Guidelines for National Greenhouse Gas Inventories; Volume 2 Energy, Chapter 1 Introduction
Value applied	0.0156
Justification of choice of data or description of measurement methods and procedures applied	Use of default values from the most recent version of the IPCC Guidelines for National Greenhouse Gas Inventories
Purpose of data	Calculation of baseline and project emission.
Comments	No Comments

Data / Parameter	BC _{ex-ante,b,i}
Data unit	tonnes
Description	Ex-ante annual average quantity of fuel used per baseline device type i
Source of data	Option 1: A measurement campaign following the Kitchen Performance Test Protocol must be designed, carried out, and analyzed in compliance with the most recent version of the CDM Standard for Sampling and Surveys for CDM Project Activities and Programmes of Activities. The campaign must achieve a confidence and precision of at least 90/10 for the target parameter of average daily fuel consumption per adult equivalent. Where the project does not achieve the target precision in a monitoring period, the project proponent must apply an appropriate conservativeness deduction as per Section 4 of the most recent version of the CDM Standard for Sampling and Surveys for CDM Project Activities and Programmes of Activities. The result must be scaled appropriately using the average household size to obtain the value of BC_{ex-ante,b,i}.
Value applied	2.6188 tonnes/HH/year
Justification of choice of data or description of	N/A

measurement methods and procedures applied	
Purpose of Data	Calculation of baseline emissions
Comments	Energy consumption must be determined once prior to validation.

Data / Parameter	EF _{b,i,CO2} EF _{p,j,CO2}
Data unit	t CO ₂ /TJ
Description	CO ₂ emission factor for fuel used by baseline device type i in the baseline scenario CO ₂ emission factor for fuel used by project device type j in the project scenario
Source of data	2006 IPCC Guidelines for National Greenhouse Gas Inventories; Volume 2 Energy, Chapter 2 Stationary Combustion
Value applied	112
Justification of choice of data or description of measurement methods and procedures applied	Use of default values from the most recent version of the IPCC Guidelines for National Greenhouse Gas Inventories
Purpose of data	Calculation of baseline and project emission
Comments	No Comments

Data / Parameter	EF _{b,i,non CO2} EF _{p,j,non CO2}
Data unit	tCO _{2e} /TJ
Description	Non-CO ₂ emission factor for fuel used by baseline device type i in the baseline scenario Non-CO ₂ emission factor for fuel used by project device type j in the project scenario
Source of data	2006 IPCC Guidelines for National Greenhouse Gas Inventories; Volume 2 Energy, Chapter 2 Stationary Combustion
Value applied	9.46
Justification of choice of data or description of measurement methods and procedures applied	Use of default values from the most recent version of the IPCC Guidelines for National Greenhouse Gas Inventories (AR5 GWP)
Purpose of data	Calculation of baseline emission
Comments	No Comments

Data / Parameter	$\eta_{old,avg}$
Data unit	Fraction
Description	Weighted average efficiency of baseline devices that are replaced by project devices
Source of data	Methodological default value
Value applied	0.15
Justification of choice of data or description of measurement methods and procedures applied	For three-stone fire using firewood or a cookstove with no improved combustion air supply or flue gas ventilation, default value of 15% as per applied methodology (VM0050, v1.0)
Purpose of data	Calculation of baseline emissions
Comments	N/A

Data / Parameter	Hh _i Hh _{j,k}
Data unit	Equivalent standard male adults
Description	Average household size of the target population using device type i Average household size of the target population using device type j from batch k
Source of data	Baseline and project survey ²¹ The campaign must achieve a confidence and precision of at least 90/10 for the target parameter of average household size.
Value applied	Hh _i : 3.2663 Hh _{j,k} : 3.2436
Justification of choice of data or description of measurement methods and procedures applied	Recognized survey methods based on the CDM Standard for Sampling and Surveys for CDM Project Activities and Programmes of Activities
Purpose of data	Estimation of average energy consumption when applying Option 1: Measurement campaign (Section 8.1.1 of applied methodology VM0050, v1.0)) Cross-checking energy and fuel consumption values
Comments	This parameter must be determined ex ante via the baseline survey as described in Section 6.2 of applied methodology VM0050, v1.0.

²¹ as per KPT survey

Note: Values in this table are considered from KPT assessment.

4.2 Data and Parameters Monitored

Data / Parameter	$N_{j,k,y}$
Data unit	Number
Description	Number of commissioned project devices of type j from batch k in year y
Source of data	Monitoring
Description of measurement methods and procedures to be applied	The following data are recorded during project activity implementation: 1) Number of new devices distributed under the project activity, identified by the type of device and date of commissioning; and 2) Identification information of the recipient of the device distributed under the project activity (e.g., name, address, phone number). Data management and reporting of this information must adhere to both data privacy requirements and good practice.
Frequency of monitoring/recording	Every time that new project devices are distributed
Value monitored	119,938 (total no. of project devices distributed) ICS in 59,969 households
Monitoring equipment	No equipment was used to monitor this parameter
QA/QC procedures to be applied	Transparent data analysis & reporting
Purpose of the data	Calculation of baseline and project emissions
Calculation method	N/A
Comments	The number of project devices distributed will be recorded in a project stove registration database.

Data / Parameter	$\eta_{j,k,y}$
Data unit	Fraction
Description	Proportion of commissioned project devices of type j from batch k that are still being used regularly in year y
Source of data	Monitoring
Description of measurement methods	For monitoring period 01-April-2023 to 31-March-2025 PP has chosen the option 2 (Surveys) to get the proportion of project devices in operation.

and procedures to be applied	Option 1 (SUMs): Measured directly using stove use monitors (SUMs) in a sample of users according to the most recent version of the CDM Standard for Sampling and Surveys for Project Activities and Programmes of Activities and achieving 90/10 confidence precision for the proportion of devices in operation. The SUMs must confirm that the stove is frequently used and functional. PP may use option 1: (SUMs) for future verification. Option 2 (surveys): Based on an adoption rate determined by a survey according to the most recent version of the CDM Standard for Sampling and Surveys for Project Activities and Programmes of Activities and achieving 90/10 confidence precision for the proportion of devices in operation. The lower end of the 90% confidence interval must be used to ensure conservativeness. The adoption survey must include: - Kitchen observation (which includes visual and physical checks of the stove and its components), including photographic evidence; and - Interview with the primary cook. (The project proponent provides training and supervision as required to ensure field teams have the capacity required to complete adoption surveys successfully)												
Frequency of monitoring/recording	Option 1: (SUMs): continuous Option 2 (surveys): annually												
Value monitored	<table border="1"> <thead> <tr> <th>Period</th><th>$n_{j,k,y}$ (Proportion of commissioned project devices)</th></tr> </thead> <tbody> <tr> <td>Age 1</td><td>0.594</td></tr> <tr> <td>Age 2</td><td>0.594</td></tr> <tr> <td>Age 3</td><td>0.594</td></tr> <tr> <td>Age 4</td><td>0.594</td></tr> <tr> <td>Age 5</td><td>0.594</td></tr> </tbody> </table> (For current MP, PP has chosen Option 2 and the value from the survey results used for emission reduction estimates) The PP has conducted MRV survey where usage rate is obtained as 59.4%. As per VM0050 v1.0 <i>Corrections and Clarifications</i> clarification 2, 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 whether the project meets the specified requirements (vide sr. no. 1, 2, 3) The project activity has met the requirement as described below:	Period	$n_{j,k,y}$ (Proportion of commissioned project devices)	Age 1	0.594	Age 2	0.594	Age 3	0.594	Age 4	0.594	Age 5	0.594
Period	$n_{j,k,y}$ (Proportion of commissioned project devices)												
Age 1	0.594												
Age 2	0.594												
Age 3	0.594												
Age 4	0.594												
Age 5	0.594												

	1. <i>Selection of technologies and fuels that fully meet the cooking needs of the target population, demonstrated by citing robust research or conducting an investigation of cooking practices and attitudes.</i> - The target population in rural household in Kenya uses partially non-renewable wood fuel over rudimentary cookstoves or three-stone fires for cooking. This is supported by the Table 2.2 of “Demographic and Health Survey 2022, Volume 1²²” - Under this project, two Total Land Care (TLC) Rocket Stoves are deployed in each household. Other comparable ICS model(s) may be added based upon request of the end users. This ensures that the distributed technology and fuel type fully meet the cooking needs of the target population. 2. <i>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.</i> - At the time of distribution/installation of stove PP has provide comprehensive, hands-on training on proper stove operation, routine maintenance, and basic troubleshooting to the end users. Also, the PP has provided detailed, easy-to-understand manuals and repair guides. Stove champions conduct frequent visits to access the quality of maintenance/repair activity if any performed by end users. 3. <i>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)</i> - PP has provided helpline number enabling the end users to easily reach out with feedback, request for maintenance or any grievances. Hence, the project fully complies with all three conditions set out under Clarification 2 of VM0050 v1.0 Corrections and Clarifications, Thereby the PP has considered the operational rate of 59.4%, as reported in the most recent MP MRV survey, compared to cap of 90% which is a conservative approach.
Monitoring equipment	N/A

²² <https://www.knbs.or.ke/wp-content/uploads/2023/08/Kenya-Demographic-and-Health-Survey-2022-Main-Report-Volume-1.pdf>

QA/QC procedures to be applied	The date on which a sample project device stopped being used should be taken as follows: Option 1: (SUMs): The date on which the SUM ceased registering any activity of the project device. Option 2 (surveys): Where the project device is not working or not being used at the time of conducting the survey, it should be conservatively assumed that the project device has not been active since the date on which the last adoption survey was conducted.
Purpose of the data	Calculation of baseline and project emissions
Calculation method	N/A
Comments	For both Options 1 and 2, where the project does not achieve the target precision in a monitoring period, the project proponent must apply an appropriate conservativeness deduction as per Section 4 of the most recent version of the CDM Standard for Sampling and Surveys for CDM Project Activities and Programmes of Activities.

Data / Parameter	$f_{NRB,y}$
Data unit	Fraction
Description	Fraction of woody biomass that is established to be non-renewable used by device in year y
Source of data	Tool 33: Default value for common parameters. Version 03.0
Description of measurement methods and procedures to be applied	Tool 33: Default value for common parameters. Version 03.0
Frequency of monitoring/recording	Ex-ante for each crediting period
Value monitored	0.29
Monitoring equipment	N/A
QA/QC procedures to be applied	N/A
Purpose of the data	Calculation of baseline and project emissions
Calculation method	N/A
Comments	This parameter has been fixed ex-ante for the crediting period

Data / Parameter	$BC_{b,i,y}$
Data unit	tonnes

Description	Fuel used per baseline device type i during year y												
Source of data	PP has chosen Option 1: Kitchen performance test as per the applied methodology (VM0050, v1.0)												
Description of measurement methods and procedures to be applied	Follow-up baseline surveys must be conducted every five years²³ in control households that do not participate in the project, established prior to validation as statistically equivalent to the pre-project conditions of project households regarding baseline fuel consumption. Measurement campaign must be updated where follow-up baseline surveys show that the fuels, fuel sources, or technologies used by the control group are no longer statistically equivalent to the pre-project conditions of project households. The measurement campaign must be designed, carried out, and analyzed in compliance with the most recent version of the CDM Standard for Sampling and Surveys for CDM Project Activities and Programmes of Activities. The result must be scaled appropriately using the average household size to obtain the value of $BC_{b,i,y}$.												
Frequency of monitoring/recording	Every five years												
Value monitored	<table border="1"> <thead> <tr> <th>Period</th><th>$BC_{b,i,y}$ (Fuel used per baseline device)</th></tr> </thead> <tbody> <tr> <td>Age 1</td><td>2.6188 tonnes/HH/year</td></tr> <tr> <td>Age 2</td><td>2.6188 tonnes/HH/year</td></tr> <tr> <td>Age 3</td><td>2.6188 tonnes/HH/year</td></tr> <tr> <td>Age 4</td><td>2.6188 tonnes/HH/year</td></tr> <tr> <td>Age 5</td><td>2.6188 tonnes/HH/year</td></tr> </tbody> </table>	Period	$BC_{b,i,y}$ (Fuel used per baseline device)	Age 1	2.6188 tonnes/HH/year	Age 2	2.6188 tonnes/HH/year	Age 3	2.6188 tonnes/HH/year	Age 4	2.6188 tonnes/HH/year	Age 5	2.6188 tonnes/HH/year
Period	$BC_{b,i,y}$ (Fuel used per baseline device)												
Age 1	2.6188 tonnes/HH/year												
Age 2	2.6188 tonnes/HH/year												
Age 3	2.6188 tonnes/HH/year												
Age 4	2.6188 tonnes/HH/year												
Age 5	2.6188 tonnes/HH/year												
Monitoring equipment	Weighing scales & Digital Moisture Detectors												
QA/QC procedures to be applied	The campaign must achieve a confidence and precision of at least 90/10 for the target parameter of average daily fuel consumption per adult equivalent. Where the project does not achieve the target precision in a monitoring period, the project proponent must apply an appropriate conservativeness deduction as per Section 4 of the most recent version of the CDM Standard for Sampling and Surveys for CDM Project Activities and Programmes of Activities²⁴. Equipment is calibrated at appropriate intervals as per the manufacturer's specifications.												
Purpose of the data	Calculation of baseline emissions												
Calculation method	N/A												

²³ CORRECTION AND CLARIFICATIONS TO VM0050 ENERGY EFFICIENCY AND FUELSWITCH MEASURES IN COOKSTOVES, V1.0

²⁴ https://cdm.unfccc.int/sunsetcms/storage/contents/stored-file-20210531160756223/Meth_Stan05.pdf

Comments	1) The KPTs were conducted by a competent team trained for performing KPTs based on the KPT protocol. The KPT questionnaire has the provision of accounting seasonal variation as per the KPT protocol. 2) Baseline follow up surveys be conducted by PP /PP representatives/may be by third-party agencies
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Data / Parameter	$\eta_{\text{new,avg,y}}$												
Data unit	Fraction												
Description	Weighted average efficiency of project devices in year y												
Source of data	Monitoring												
Description of measurement methods and procedures to be applied	Manufacturer-certified value that is determined via Water Boiling Test. The decrease in thermal efficiency of project device j from batch k due to aging accounted for during the monitoring period as presented below: For devices using biomass or fossil fuel, one of the following options must be selected, listed in descending order of preference: a) Standard Water Boiling Test campaigns²⁵ b) A linear decrease approach, applying a default schedule of linearly decreasing efficiency up to the terminal efficiency (assumed to be 25%) through the lifespan of the project device²⁶ PP Has chosen the sub option (b) above i.e., linear decrease approach to determine the project stove efficiency.												
Frequency of monitoring/recording	Annually												
Value monitored	<table border="1"> <thead> <tr> <th>Period</th><th>$\eta_{\text{new,avg,y}}$ (Weighted average efficiency of project devices)</th></tr> </thead> <tbody> <tr> <td>Age 1</td><td>0.3450</td></tr> <tr> <td>Age 2</td><td>0.3355</td></tr> <tr> <td>Age 3</td><td>0.3260</td></tr> <tr> <td>Age 4</td><td>0.3165</td></tr> <tr> <td>Age 5</td><td>0.3070</td></tr> </tbody> </table>	Period	$\eta_{\text{new,avg,y}}$ (Weighted average efficiency of project devices)	Age 1	0.3450	Age 2	0.3355	Age 3	0.3260	Age 4	0.3165	Age 5	0.3070
Period	$\eta_{\text{new,avg,y}}$ (Weighted average efficiency of project devices)												
Age 1	0.3450												
Age 2	0.3355												
Age 3	0.3260												
Age 4	0.3165												
Age 5	0.3070												
Monitoring equipment	N/A												

²⁵ Must be carried out following national standards (where available) or international standards or guidelines.

²⁶ Consider non-binding best practice example 6 in AMS-II.G.

QA/QC procedures to be applied	N/A
Purpose of the data	Calculation of baseline and project emissions
Calculation method	N/A
Comments	N/A

Data / Parameter	BC _{p,j,k,y}													
Data unit	tonnes													
Description	Average quantity of fuel used by project device type j from batch k during year y													
Source of data	Monitoring													
Description of measurement methods and procedures to be applied	PP has chosen Option 1: Kitchen performance test as per the applied methodology (VM0050, v1.0) A measurement campaign following the Kitchen Performance Test protocol designed, carried out, and analyzed in compliance with the most recent version of the CDM Standard for Sampling and Surveys for CDM Project Activities and Programmes of Activities. The campaign must achieve confidence and precision of at least 90/10 for the target parameter of average daily fuel consumption per adult equivalent. The result scaled appropriately using the average household size to obtain the value of BC_{p,j,k,y}. Project activities applying KPTs must also measure the quantity of fuel used by pre-project devices that are still operational and provide it in the calculation sheet and monitoring reports (this is a reporting-only requirement).													
Frequency of monitoring/recording	Biennial													
Value monitored	<table><tr><td>Period</td><td>BC_{p,j,k,y} (Average quantity of fuel used by project device)</td></tr><tr><td>Age 1</td><td>2.2224 tonnes/HH/year</td></tr><tr><td>Age 2</td><td>2.2224 tonnes/HH/year</td></tr><tr><td>Age 3</td><td>2.2224 tonnes/HH/year</td></tr><tr><td>Age 4</td><td>2.2224 tonnes/HH/year</td></tr><tr><td>Age 5</td><td>2.2224 tonnes/HH/year</td></tr></table>		Period	BC _{p,j,k,y} (Average quantity of fuel used by project device)	Age 1	2.2224 tonnes/HH/year	Age 2	2.2224 tonnes/HH/year	Age 3	2.2224 tonnes/HH/year	Age 4	2.2224 tonnes/HH/year	Age 5	2.2224 tonnes/HH/year
Period	BC _{p,j,k,y} (Average quantity of fuel used by project device)													
Age 1	2.2224 tonnes/HH/year													
Age 2	2.2224 tonnes/HH/year													
Age 3	2.2224 tonnes/HH/year													
Age 4	2.2224 tonnes/HH/year													
Age 5	2.2224 tonnes/HH/year													
Monitoring equipment	Weigh scales & Moisture meters													
QA/QC procedures to be applied	As a crosscheck, compare results to government publications, peer-reviewed literature, third party assessments, and/or official data or statistics.													

	Where SUMs are used to measure project stove adoption, the stove usage indicated by the measurements for this parameter must be consistent with the frequency of use indicated by SUM measurements. Equipment is calibrated at appropriate intervals as per the manufacturer's specifications.
Purpose of the data	Calculation of baseline and project emissions
Calculation method	N/A
Comments	1) The KPTs were conducted by a team trained for performing KPTs based on the KPT protocol. The KPT questionnaire accounts for seasonal variation as per the KPT protocol. 2) Where the project does not achieve the target precision in a monitoring period, the project proponent must apply an appropriate conservativeness deduction as per Section 4 of the most recent version of the CDM Standard for Sampling and Surveys for CDM Project Activities and Programmes of Activities²⁷

4.3 Monitoring Plan

Monitoring Plan – Sampling Plan

The sampling plan, including design, data collected, and implementation plan are outlined below.

Sample Design

Due to the large number of ICS distributed under the project, it is not economically feasible to monitor each individual household. Instead, a representative sample was selected for monitoring, in line with the requirements of the methodology. Samples were drawn from the project database, administered by the project proponent.

Objectives and reliability

The objective is to obtain an unbiased and reliable estimate of the proportion or mean value of the following key variables over the course of the crediting period. As per applied methodology VM0050 a precision level of 90/10.

Monitored parameters:

Sr. No.	Monitoring parameter	Sampling parameter	Parameter type	Monitoring frequency
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²⁷ https://cdm.unfccc.int/sunsetcms/storage/contents/stored-file-20210531160756223/Meth_Stan05.pdf

1	$N_{j,k,y}$	Number of commissioned project devices of type j from batch k in year y	-	Every time that new project devices are distributed
2	$n_{j,k,y}$	Proportion of commissioned project devices of type j from batch k that are still being used regularly in year y	Proportion value	Continuous or annually ²⁸
3	$BC_{b,i,y}$	Fuel used per baseline device type i during year y	Mean value	Every five years
4	$BC_{p,j,k,y}$	Average quantity of fuel used by project device type j from batch k during year y	Mean Value	biennial

Target population

The target population are all households in the project database cooking with fuelwood in ICS distributed under the project.

Sample Size

The procedure to determine the sample of households will ensure that they adequately represent the broader project population, minimizing sampling error. Using a 90 per cent confidence level, and a 10 per cent margin of error, a random sample will be selected from each strata.

Sample size refers to the number of observations or individuals included in a statistical study or experiment. Determining the appropriate sample size is critical to ensuring that the results of the study are accurate and representative of the population being studied.

- Mean values: Corresponding to average values inferred from data that are often referred to as continuous variables.
- Proportion (or percentage) values: Values that are derived from data that are described as attributes, yes/no data, or binary data.

As per Guideline for Sampling and surveys for CDM project activities and programmes of activities, version 04.0, there are different ways available to obtain the estimates of the parameter of interest:

- Refer to the result of previous studies and use these results.
- In a situation where information from previous studies is not available, a preliminary sample as a pilot could be conducted and use that sample is used to provide the estimates;
- Use best guesses based on the researcher's own experiences.

Calculation approach for random sampling are as follows:

Sample size determination for mean parameter

²⁸ Refer to the parameter table for more detail.

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

$$V = \left(\frac{SD}{mean} \right)^2$$

Where,

n	=	Sample size for households
N	=	Total number of households
SD	=	Expected standard deviation
mean	=	Expected mean, depends on similar studies or location
1.645	=	Represents the 90% confidence required
0.1	=	Represents the 10% relative precision

Sample size determination for proportion parameter

The equation for a 90/10 confidence/precision to give the required sample size is:

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

Where,

n	=	Sample size for households
N	=	Total number of households
p	=	Expected proportion of parameter of interest
1.645	=	Represents the 90% confidence required
0.1	=	Represents the 10% relative precision

The result, n, represents the number of households with data available for analysis. Where it is anticipated that a certain proportion of the sampled households will respond, adjust this number accordingly by dividing n by the anticipated proportion.

The expected proportion must not be more than one. A conservative range to apply could be between 0.5 to 0.7.

The equation for 95/10 confidence/precision to give the required sample size is:

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

Where

n	=	Sample size for households
N	=	Total number of households
p	=	Expected proportion of operating cookstoves
1.645	=	Represents the 90% confidence required
0.1	=	Represents the 10% relative precision

The PP may choose to use the same sample to monitor more than one parameter. According to the Standard for sampling and surveys for CDM project activities and programme of activities, if there is more than one parameter to be estimated, then a sample size calculation should be done for each of them. Then either the largest number for the sample size is chosen as sampling effort with one common survey, or separate sampling efforts and surveys are undertaken for each parameter. For instance, the project proponent may sample separately $n_{j,k,y}$ and $BC_{p,j,k,y}$ – or a combination of these parameters in the same sample. Sampling more than one parameter within the same sample (household) helps reduce travel needs for monitoring and the associated costs. At the same time this approach ensures the random selection of samples for every parameter.

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

Sampling Frame

Overall, all ICS have the same group of end users, households. It is expected that end users can be assumed to be highly homogeneous for each ICS model. To formulate sample frame, all ICS operating will be combined together. The number of project devices operating may vary with ICS type, fuel used and project area where they are located & efficiency of the ICS depends on the ICS type and ICS age group. However, since efficiency for the stoves will be determined using default loss rate, the main sub-groups of ICS will be based on ICS type, fuel use and project area where they are located.

Sampling Approach

The PP adopted a cluster random sampling approach to select the households. As the project population is spread over a large geographic area, simple random sampling could result in a widely distributed set of households that could require significant resources to monitor. The cluster random sampling approach selects a sample that is more logistically feasible to monitor while maintaining the same statistical representativeness of a simple random sample.

In our context, rural households within each county have similar socioeconomic and environmental characteristics, making them relatively homogeneous regarding fuelwood consumption patterns. As such, the cluster randomized approach provides a sample that is statistically representative as simple random sampling. Further, oversampling ensures that the final sample is representative. It supports that the primary selection criterion for installation is the need for ICS, indicating a shared need and context among the target households.

The PP used a cluster random sampling approach outlined below:

Spatial Clustering

Using locality information (county, sub-county/district, commune, village), households were clustered. To ensure an operationally feasible minimum cluster size, clusters with fewer than 30 households are merged with their nearest neighbor until a minimum cluster size of at least 30 households is achieved.

Household Randomization

All households in the project database are first sorted lexicographically. A cryptographically random value from the National Institute of Standards and Technology (NIST) Randomness Beacon is fetched to serve as a reproducible seed. The NIST Randomness Beacon generates and posts full entropy bitstrings once a minute.²⁹ These values are numbered, time-stamped and signed. As local random number generators can be manipulated, we rely on this approach to guarantee that randomization is objective. Further, as the NIST Randomness Beacon is recorded as described, the randomness used can be reproduced to ensure a transparent and auditable process. Using this seed, each household is shuffled and then numbered sequentially, resulting in a random ordering of all project households.

Cluster & Household Selection

Using this random ordering of project households we then select a set of clusters and within each selected cluster, we further select a subset of households for monitoring.

We assume that groups of ten households are logistically reasonable to conduct monitoring activities, including kitchen performance tests, household surveys, and installation of stove use monitors. A target number of clusters for each activity is set based on the sample size (more detail on sample size below). For Kenya, the targets were:

- KPTs: 100 households; 10 clusters
- MRV survey: 190 households; 19 clusters
- dMRV: 670 households; 67 clusters

Clusters are selected in order from the random ordering of all project households. If Household 1, per the random ordering, is in cluster C, then cluster C is a selected cluster. Then the cluster of Household 2 and so on is selected until enough unique clusters are identified for all MRV activities.

²⁹ In cryptography, unpredictability is measured in terms of entropy. Per NIST, a full entropy bit-string has an amount of entropy equal to its length and ideal randomness properties. The NIST assumes that a bitstring has full entropy if the amount of entropy per bit is at least $1-\epsilon$ where ϵ is at most 2^{-32} . Additional discussion on this assumption is available at: <https://nvlpubs.nist.gov/nistpubs/ir/2023/NIST.IR.8427.pdf>.

From these clusters, households are selected. For each cluster, the first household in the random ordering of all project households is selected. Continuing sequentially down the random ordering list, only households in the same cluster as the first household and within one kilometer of households selected thus far are added. That is, the second household must be within one kilometer of the first household. The third household must be within one kilometer of the center point between the first and second household, and so on until 15 or 25 households are selected. For clusters used for KPTs, groups of 25 households are selected. For the remaining clusters, groups of 15 households are selected. If, using the first household, a group of 15 or 25 households meeting this criterion cannot be found, the first household is discarded and the second household is used as the initial household, and the selection is attempted again. It is re-attempted as many times as needed until 15 or 25 households are selected within the cluster for each randomly selected cluster.

From this clustering, the necessary number of clusters are selected for each monitoring activity. That is, 10 clusters are selected for KPTs, 19 for MRV survey, and 67 for dMRV following the same random ordering for potential monitoring.

This sample includes 15 or 25 households per cluster, of which 10 are actually monitored. The additional households account for cases such as households not being available or consenting to participate. Enumerators will visit as many households as required of the 15 or 25 to enroll 10 households and then stop.

Details of estimated sample size v/s actual sample size are as follows.

Description	Estimated Sample Size	Actual Samples Selected	Survey Period
Baseline KPT Survey	100	81 ³⁰	07-April-2025 to 10-May-2025
Project KPT Survey	100	81 ³¹	07-April-2025 to 17-April-2025
Project Monitoring Survey	190	190	25-April-2025 to 01-May-2025

Data to be collected:

Field measurement:

The table below summarizes field measurement data requirements:

Parameter	Frequency as per methodology	Methods to be applied	Comments on seasonal fluctuation
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³⁰ For baseline KPT survey PP has chosen to do 100 samples but in actual 81 samples were received as responded samples and PP has chosen to stop the survey as the required level of confidence/precision has been reached.

³¹ For project KPT survey PP has chosen to do 100 samples but in actual 81 samples were received as responded samples and PP has chosen to stop the survey as the required level of confidence/precision has been reached.

$n_{j,k,y}$	Continuous or annually	Visits to the premises, visual inspection and interview with ICS end-user	No effects of seasonal fluctuation
$BC_{p,j,k,y}$	Biennial	Visits to the premises, visual inspection, measurement of consumed quantity and interview with ICS end-user.	Surveys will be carried out in dry season to lead to conservative results

Data archiving:

All data is recorded on a mobile phone application in a digital survey system. The data collection includes a number of checks to ensure integrity. Information collected from the registration or other means of acceptance by the users will be stored on a server. All data monitored and required for verification and issuance will be kept for two years after the end of the crediting period or the last issuance of credits for the project activity, whichever is later.

Quality assurance/Quality control:

The PP will apply measures to ensure the required confidence/precision for each sampled parameter is met, allowing for non-response and the possible removal of outliers from the sample, as part of a Quality Control/Quality Assurance system. The choice of measure applied to each parameter will depend on the cost of each data collection approach and logistics required. The project proponent will determine the most effective measure for each parameter from the following list:

- Oversampling: Randomly draw a sample more than the calculated number (say 20%) and collect data from each
- Buffer Group: Randomly draw additional samples (say 20%) and collect data from only for minimum numbers of ICS as per sample size calculation. If this does not result in the required sample size, additional data is collected from households that were selected in the sample.
- If precision required is not achieved by reliability check, use the lower bound or upper bound of estimates of the parameters.

The sampling plan has the following procedures in place to ensure good quality data. The PP has ensured that field personnel have reviewed, understand and have agreed to follow the monitoring plan procedures, including provisions for maximizing response rates, documenting out-of-population cases, refusals and other sources of non-response. A quality control and assurance strategy has been documented. Quality control and assurance strategies include addressing non-sampling errors, such as non-response or bias from interviewers. The project implementer or a competent third party designated by the project proponent with the proper skills will train the monitoring personnel on how to properly survey households to prevent bias from interviewers. When a household refuses to participate, another household will be chosen at random. To reduce interviewer bias, good questionnaire design and well-tested questionnaires will be used. Instruments used during monitoring surveys will be calibrated in accordance with

their manufacturer's specification or as per standard industry procedures. Evidence of same shall be submitted to VVB at the time of verification.

The sample data for mean value parameter is continuous and therefore the presence of outliers is possible. In accordance with the BC SOP "Kitchen Performance Test Standard Operating Procedure, v1.1 dated 15 March 2025 all data points identified as outliers will be examined. The outliers are retained / removed based on their merit.

- Retain the outlier: The values are above outlier threshold, but they are business as usual scenario representing real world behaviors then they will be retained.
- Remove the outlier: If the values are outside the business usual scenario, for example gathering at home or fuel measurement values exceeding practical limits (e.g. 15 kg per capita per day).

Analysis

The project proponent will manage a project database that includes the following data that can be directly attributable to each ICS within the project, thereby allowing unambiguous determination of the emission reductions attributable to each project:

- A list of households participating in each project, including name, location, distribution/installation date and unique serial numbers
- Where replacements are made, assurance that the efficiency of the new ICS is similar to the specified.

Data obtained from the samples will be used to estimate proportions and mean values for the parameters described above. The values will then be factored into the emissions reduction calculations and result in the request for issuance of VCUs. The parameters are applied for emission reduction calculations. The stoves that are not in use will be excluded from emissions reductions calculations and will not be counted towards the total number of ICS in operation during the monitoring period.

Implementation

Sampling for the purpose of emission reduction calculation and elaboration of the monitoring report will occur at the end of each monitoring period. This sampling will be conducted by trained personnel from the project proponent.

The credentials and/or training materials for the sampling personnel will be provided to the VVB at verification. The maximum length of one monitoring period will be two years (duration, not calendar years), with the option of annual or bi-annual monitoring. The project implementer will be responsible for managing household data collection and entry into the project database. Field personnel will receive training on surveying techniques and reducing errors as well as sign a document certifying that there is no conflict of interest of those involved in data collection and

analysis. If there is conflict of interest, the personnel will not be allowed to participate in data collection and analysis. The project database will record the start and end dates of each monitoring period and record the emission reductions attributable to each monitoring period.

Appropriate record-keeping procedures will be implemented to ensure that each monitoring period data set can be transparently attributed to its corresponding project, preventing any occurrences of double counting. An internal review of the project database will be able to determine the current status of each project— the duration of previous monitoring periods, the households delivering monitoring data, and current verification activities.

Avoidance of Double Counting

The PP has signed a contract with ICS manufacturer that they will not claim any GHG emission reduction for the ICS manufactured and distributed.

The PP has signed an end user agreement with the household taking the benefit of ICS that they are the owner of the ICS but they will not claim any emission reduction and Bridge Carbon will be sole entity claiming the GHG reductions.

Project Database

The project database will be derived from the Installation Record. All data collected in relation to the project will be held in the central office / Data management System of the PP and maintained for the entire life cycle of the project and an additional two years thereafter. The end users of the cookstoves are identified and included in the cookstove user list for the duration of the project and updated when required.

Data and Information for Carbon Operations (DISCO): The data collection process is supported by a modular system architecture designed to ensure data integrity, operational flexibility, and strong access control. Key components include FOPS (Field Operations), MOPS (Mobile Operations), CPIM (Carbon Portfolio and Inventory Management), and UMAP (User Management, Access & Permissions), each playing a specific roll in the data lifecycle.

This multilayered approach ensures only complete and logically sound data are approved in the system.

The system follows industry-standard data protection practices:

- Encryption: All data is encrypted in transit and at rest.
- Access control: Role-based access minimizes data exposure.
- Device security: MOPS supports device-level encryption and corporate enrolled devices enable secure data wipe features.
- Compliance:
 - The platform is designed toward supporting applicable data privacy frameworks
 - The platform's geographically distributed backend supports compliance with data sovereignty requirements with the capability to domicile physical storage of protected

information such as names, phone numbers, and address information within specific countries where required by law

Managing data in proprietary software ('DISCO'), which provides end-to-end data management and reduces errors, miscalculations from incorrect data entry.

Ongoing Monitoring Studies

The following ongoing monitoring studies are conducted for each project scenario following verification of the associated initial project studies.

- Monitoring usage with KPTs and dMRV
- Continuous dMRV sampling up to 2% of households for each project (far greater than 90/10 CI). The stoves are randomly chosen for monitoring by the dMRV provider as described above; data is end-to-end encrypted and only accessible by the third party dMRV provider.
- MRV field data is collected with digital tablets using a platform designed and maintained by the dMRV provider.
- Partnering with Berkeley Air Monitoring Group to train staff on KPT data collection and encode best practices in a new Standard Operating Procedure
- Partnering with Geocene (third-party) for usage monitoring using dMRV devices.

The PP will be adopting the new VM0050 methodology, Digital Monitoring, Reporting, and Verification Tool recognized as the most rigorous in the industry, and we are implementing stringent systems, processes, and training internally.

5 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

5.1 Baseline Emissions

As per VM0050, baseline emissions are calculated as follows:

PP has calculated the emission reduction for each household with cookstove installed under the grouped project separately. In this section an example for ER Calculation of **Age 1** is being provided.

Assumption			
Sr. No.	Parameter	Unit	Age 1
1	Average household size of the target population using device type i (Hh_i)	Persons/HH	3.2663
2	Average household size of the target population using device type j from batch k ($Hh_{j,k}$)	Persons/HH	3.2436
3	Fuel used per baseline device type i during year y ($BC_{b,i,y}$)	kg/capita/day	2.1967

4	Fuel used per baseline device type i during year y ($BC_{b,i,y}$)	tonnes/HH /year	2.6188
5	Average quantity of fuel used by project device type j from batch k during year y ($BC_{p,j,ky}$)	kg/capita/day	1,8771
6	Average quantity of fuel used by project device type j from batch k during year y ($BC_{p,j,ky}$)	tonnes/HH /year	2.2224
7	Fraction of Non-renewable biomass (f_{NRB})	fraction	0.29
8	Proportion of commissioned project devices of type j from batch k that are still being used regularly in year y ($n_{j,k,y}$)	percentage	0.594
9	Weighted average efficiency of project devices in year y ($\eta_{new,avg,y}$)	fraction	0.3450

$BE_y = \sum_{i,j,k} EC_{i,y} \times N_{j,k,y} \times n_{j,k,y} \times (EF_{b,i,CO_2} \times f_{NRB,y} + EF_{b,i,nonCO_2}) \quad (1)$			
Parameter	Description	Value	Unit
BE_y	Baseline emissions during year y	1.0178	t CO ₂ e
$EC_{i,y}$	Average energy consumption of baseline device type i in year y	0.0409	TJ
$N_{j,k,y}$	Number of commissioned project devices of type j from batch k in year y	1	number
$n_{j,k,y}$	Proportion of commissioned project devices of type j from batch k that remain operating in year y	0.594	fraction
EF_{b,i,CO_2}	CO ₂ emission factor for fuel used by baseline device type i in the baseline scenario	112	t CO ₂ /TJ
f_{NRB}	Fraction of woody biomass that is established to be non-renewable used by baseline device type i in year y in the baseline scenario (fraction); this variable is not considered for fossil fuels	0.29	fraction
$EF_{b,i,nonCO_2}$	Non-CO ₂ emission factor for fuel used by baseline device type i in the baseline scenario	9.46	t CO ₂ /TJ

$EC_{i,y} = BC_{b,i,y} \times NCV_{b,i} \quad (2)$			
Parameter	Description	Value	Unit
$EC_{i,y}$	Average energy consumption of baseline device type i in year y	0.0409	TJ
$BC_{i,y}$	Fuel used per baseline device type i during year y (tonnes)	2.6188	tonnes
$NCV_{b,i}$	Net calorific value of baseline fuel for baseline device type i	0.0156	TJ/tonne

$EC_{est,y} = EC_{p,y} \times \frac{\eta_{new,avg,y}}{\eta_{old,avg}} \quad (3)$			
Parameter	Description	Value	Unit
$EC_{est,y}$	Back-calculated energy consumption of the potential mix of devices and fuels in the baseline in year y	0.0797	TJ

$EC_{p,y}$	Energy used in project scenario by project devices during year y	0.0347	TJ
$\eta_{new,avg,y}$	Weighted average efficiency of project devices in year y	0.3450	Fraction
$\eta_{old,avg}$	Weighted average efficiency of baseline devices that are replaced by project devices	0.15	Fraction

$EC_{p,y} = \sum_{i,k} BC_{p,j,k,y} \times NCV_{p,j} \quad (4)$			
Parameter	Description	Value	Unit
$EC_{p,y}$	Energy used in project scenario by project devices during year y	0.0347	TJ
$BC_{p,j,k,y}$	Average quantity of fuel used by project device type j from batch k during year y	2.2224	tonnes
$NCV_{p,i}$	Net calorific value of baseline fuel for project device j	0.0156	TJ/tonne

5.2 Project Emissions

Project emissions are calculated as follows:

$PE_y = PE_{energy,y} + PE_{others,y} \quad (6)$			
Parameter	Description	Value	Unit
PE_y	Project emissions during year y	0.8637	t CO ₂ e
$PE_{energy,y}$	Project emissions from energy consumption of project devices in year y	0.8637	t CO ₂ e
$PE_{others,y}$	Project emissions from other sources in year y	0	t CO ₂ e

$PE_{energy,y} = \sum_j \sum_k BC_{p,j,k,y} \times N_{j,k,y} \times NCV_{p,j} \times \eta_{j,k,y} \times (EF_{p,j,CO_2} \times f_{NRB,y} + EF_{p,j,nonCO_2}) \quad (7)$			
Parameter	Description	Value	Unit
$PE_{energy,y}$	Project emissions from energy consumption of project devices in year y	0.8637	t CO ₂ e
$BC_{p,j,k,y}$	average quantity of fuel used by project device type j from batch k during year y	2.2224	tonnes
$N_{j,k,y}$	Number of commissioned project devices of type j from batch k in year y	1	number
$\eta_{j,k,y}$	Proportion of commissioned project devices of type j from batch k that remain operating in year y	0.594	fraction
$NCV_{p,j}$	Net calorific value of project fuel for project device type i (Wood)	0.0156	TJ/tonne
EF_{p,j,CO_2}	CO ₂ emission factor for fuel used by project device type j in the project scenario	112	t CO ₂ /TJ
f_{NRB}	Fraction of woody biomass that is established to be non-renewable used by baseline device type i in year y	0.29	fraction

	in the baseline scenario (fraction); this variable is not considered for fossil fuels		
$EF_{p,j,non-CO2}$	Non-CO ₂ emission factor for fuel used by project device type j	9.46	t CO ₂ /TJ

Calculations of $PE_{others,y}$ from Transportation, Fuel Production, Fugitive Emissions, and Backup Generators are calculated as follows

$$PE_{others,y} = PE_{transp,y} + PE_{prod,y} + PE_{fugitive,y} + PE_{backup,y} \quad (9)$$

Where,

$PE_{transp,y}$ = Project emissions due to fuel transportation in year y (t CO₂e)

$PE_{prod,y}$ = Project emissions due to fuel production in year y (t CO₂e)

$PE_{fugitive,y}$ = Fugitive emissions in year y (t CO₂e)

$PE_{backup,y}$ = Project emissions from backup generators in year y (t CO₂e)

Project emissions from fuel transportation ($PE_{transp,y}$)

Average fuel transportation distance is less than 200 km. Hence, project emissions from fuel transportation is considered as Zero.

Project emissions from fuel production ($PE_{prod,y}$)

This is not applicable as there are no emissions resulting from soil management, cultivation, thermal/mechanical processing, and biomass burning associated with fuel production.

Fugitive emissions ($PE_{fugitive,y}$)

This is not applicable as there is no release of methane.

Project emissions from backup generators ($PE_{backup,y}$)

No project devices use electricity from a mini grid with backup generators. Hence, not applicable.

5.3 Leakage Emissions

For a Leakage emission associated with reduced or avoided use of non-renewable biomass an adjustment factor of 0.95 is applied to the GHG emission reductions in Equation (11) of section 8.3 (point 1) of methodology (i.e., $0.95 \times (BE_y - PE_y)$).

5.4 GHG Emission Reductions and Carbon Dioxide Removals

Net GHG emission reductions are calculated as follows:

$ER_y = (BE_y - PE_y) \times 0.95 - LE_{RB,y} \quad (11)$	
Date of Installation of ICS for Age 1	01-April-2023
End date of installation of ICS for Age 1	31-December-2023

Number of operational days of stove from 01-April-2023 to 31-December-2023				275	
Year Fraction			=275/365 = 0.7534		
Parameter	Description	Age 1	Calculation for one stove	Value	Unit
BE _y	Baseline emissions during year y	1.0178	=1.0178* 0.7534	= 0.7668	t CO ₂ e
PE _y	Project emissions during year y	0.8637	=0.8637* 0.7534	= 0.6507	t CO ₂ e
LE _{RBy}	Leakage emissions associated with use of renewable biomass during year y	0	0	0	t CO ₂ e
ER _y	Emission reductions during year y (Emission reduction = (Baseline Emission – Project Emission) * 0.95 – Leakage Emission)	= (1.0178 - 0.8637) * 0.95 – 0 = 0.1464	=(0.7668 - 0.6507) * 0.95 - 0	= 0.1103	t CO ₂ e

Therefore, in this manner the emission reduction for all project instances involved in the project activity during the current monitoring period has been calculated. Please refer ER calculation sheet for more details.

Vintage period	Baseline emissions (tCO ₂ e)	Project emissions (tCO ₂ e)	Leakage emissions (tCO ₂ e)	Reduction VCUs (tCO ₂ e)	Removal VCUs (tCO ₂ e)	Total VCUs (tCO ₂ e)
1-April-2023 to 31-December-2023	39,293	33,345	0	5,650	0	5,650
1-January-2024 to 31-December-2024	61,034	51,795	0	8,777	0	8,777
1-January-2025 to 31-March-2025	15,050	12,771	0	2,164	0	2,164
Total	115,377	97,911	0	16,591	0	16,591

The estimated ex-ante GHG emission reductions and carbon dioxide removals and the achieved reductions and removals for the monitoring period are as below.

Vintage period	Ex-ante estimated reductions/removals	Achieved reductions/removals	Percent difference	Explanation for the difference
1-April-2023 to 31-December-2023	25,875	5,650	-78%	

1-January-2024 to 31-December-2024	34,437	8,777	-75%	
1-January-2025 to 31-March-2025	8,468	2,164	-74%	
Total	68,780	16,591	-76%	The emission reductions generated in the current monitoring period are 76% lower than the estimated in the registered PDD. This is due to the application of 0.29 f _{NRB} value as per tool 33: Default values for common parameters, version 03.0. Also, ex-ante estimated values are calculated by considering actual values of earlier issuances.

APPENDIX 1: COMMERCIALLY SENSITIVE INFORMATION

Use the table below to describe the commercially sensitive information included in the monitoring report to be excluded in the public version.

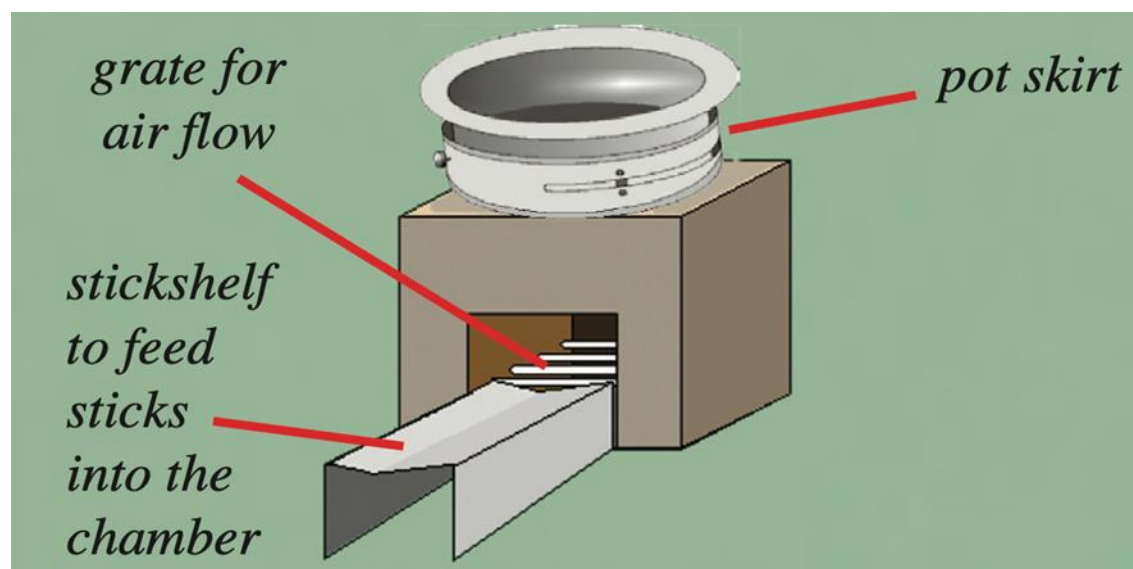
Section	Information	Justification
<u>N/A</u>	<u>N/A</u>	<u>N/A</u>

APPENDIX 2: TECHNICAL DETAILS

The ICS's design leads to greater combustion efficiency and thermal transfer to the pot compared with a traditional pot support or three-stone fire by incorporating a number of cutting-edge components, including one or more of; a 'rocket elbow'; a highly-insulated combustion chamber which provides a conducive environment for clean and efficient combustion of wood. It substantially reduces fuel wood consumption compared with a three-stone fire or traditional pot support.

Technology /Measure

TLC Rocket Stove uses a total of 15 bricks that are made using locally available clay. The average size of the brick is 22.5cm x 11cm x 6.5cm. The bricks are joined together using a mixture of five liters clay, five liters sand, five liters of manure/cow dung and five liters of water. This ensures mixtures creates well insulating bricks, reducing heat loss. Metal components have been added to the design to optimize combustion and heat transfer.



TLC Rocket Stove

Stove components

Stove has a metal top that allows the pot to sit higher improving airflow into the combustion chamber and out through the top of the stove

An adjustable metal pot skirt ensures more effective transfer of heat from the fire to the pot, increasing efficiency and also helping to block wind

TLC Rocket Stoves come with a metal stick support placed in front of and slightly into the opening of the stove. It acts as a firewood feeding platform. This ensures adequate airflow while feeding the fuel into the combustion chamber resulting in more complete combustion of fuel wood.

According to independent stove efficiency tests performed by Aprovecho Research Center on the TLC Rocket Stove, the WBT results yielded an average thermal efficiency of 34.5%.

Technical Specification	
Stove Size	Depth: 35 cm
	Width: 35 cm
	Height: 28 cm
Combustion Chamber Size	Depth: 12 cm
	Width: 12 cm
	Height: 28 cm
Efficiency	34.5%
Average Life	10 years

APPENDIX 3: VM0050 CCP ELIGIBILITY VERIFICATION REPORT CHECKLIST TEMPLATE

This table must be completed and included as an appendix to the verification report. The requirement summaries provided in the table should not be considered comprehensive; validation/verification bodies should refer to the full text of the requirements in the [ICVCM Decision on the Approval of VM0050](#).

CCP eligibility criteria and summary	Relevant section of the methodology	Project document and section where the requirement is addressed	Evidence-gathering activities, evidence checked, and assessment conclusion
<i>The CCP eligibility criteria for VM0050 are listed below</i>	<i>The section of the methodology that pertains to the CCP eligibility criteria is listed below</i>	<i>Indicate where the information is addressed (e.g., Monitoring Report Section 4.1)</i>	<i>Provide a summary of the assessment conclusion and the supporting evidence</i>
For the determination of f_{NRB}, the source of data must either be: a) the default f_{NRB} value from the latest version of CDM Tool 33 for emission reductions achieved on or before 31st December 2025 or b) the most recent national default value(s) published by UNFCCC based on the MoFuSS model.	Table for parameter " f_{NRB} " in section 9.2 of VM0050 methodology	Section 4.2 Data and Parameters Monitored	TOOL 33: Default values for common Parameters, Version 03.0
The baseline fuel consumption must be determined by either of the following two methods with cross-checks on fuel savings: a) Kitchen Performance Test (KPT) or	Section 8.1.1 and table for parameter $BC_{ex-ante,b,i}$ in Section 9.1 of VM0050 methodology	Section 4.1 "Data and Parameters Available at Validation"	Kitchen performance test

CCP eligibility criteria and summary	Relevant section of the methodology	Project document and section where the requirement is addressed	Evidence-gathering activities, evidence checked, and assessment conclusion
b) The default values of 0.5 (for air-dried fuelwood) and 0.13 (for charcoal) tonnes/capita/year or equivalent			
The baseline specific energy consumption must be determined using a Controlled Cooking Test with cross-checks on fuel savings	Section 8.1.1.1 and table for parameters “SC _{b,i} , SC _{p,j} ” in Section 9.1 of VM0050 methodology	Not applicable, as project activity is not Electric Project Devices with Additional Characteristics Affecting Energy Consumption	Not applicable, as project activity is not Electric Project Devices with Additional Characteristics Affecting Energy Consumption
For charcoal projects, either one of the following two methods must be used for calculation of baseline or project emissions (as applicable): a) direct charcoal emission factor (which may include production emissions) or b) a wood to charcoal conversion factor of 4:1 must be used	Table for parameters “EF _{b,i,CO2} , EF _{p,j,CO2} ” and “CF” in Section 9.1 of VM0050 methodology	Not Applicable, as project activity is not a charcoal project.	Not Applicable, as project activity is not a charcoal project.