



6TH MONITORING REPORT: FUEL EFFICIENT COOKING IN SOUTH AFRICA



Project title	Fuel Efficient Cooking in South Africa
Project ID	2505
Monitoring period	01-August-2024 to 24-January-2025
Original date of issue	01/08/2025
Most recent date of issue	10/05/2025
Version	9
VCS Standard Version	4.7
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PROJECT DETAILS

1.1 Summary Description of the Implementation Status of the Project

This is the 6th monitoring report for the “Fuel Efficient Cooking in South Africa” (VCS ID 2505) Grouped Project (“GP”) by TASC, which is aimed at distributing fuel-efficient improved cookstoves (ICS) to local communities in South Africa, who rely on baseline open-fire wood-fuelled cooking. This monitoring report covers the period of 01 August 2024 to 24 January 2025 (01/08/2024 – 24/01/2025).

The ICS disseminated under this GP is based on rocket stove design principles, which reduce GHG emissions from biomass burning through improved combustion efficiency of wood fuel and decreased wood fuel consumption. The ICSs improve heat transfer to cooking pots through the insulated walls and design of the stove top when compared to traditional cooking methods over open- and three-stone fires. The ICSs directly decrease wood fuel demand and reduce the pressure on the ecosystem from wood cutting within the project boundary. When compared to three-stone fire cooking, a 30-50% saving of firewood has been reported for certain ICS models¹. The time spent collecting wood fuel is reduced, saving time for especially women to engage in other economic-driven activities.

Summary of the implemented activities: Three Project Instances (“PIs”) were implemented within the GP boundary during the monitoring period, namely Project Instance 1 – Kruger 2 Canyons (PI1-K2C), Project Instance 2 – Waterberg (PI2-WB), and Project Instance 3 – Vhembe (PI3-VH).

Since the project start date, a total of 771,128 ICS have been distributed, of which 33,634 were distributed during this 6th monitoring period. In Vhembe, 13,786 stoves were distributed during MP6, and in Waterberg, 19,848 stoves were distributed. No stoves were distributed in K2C during MP6.

Implementation dates: The first ICS was distributed on 20 August 2021. The total emission reductions from all the PIs in the GP during the sixth monitoring period are as follows:

GHG emission reductions in this monitoring period:

Total:	1,941,751 tCO ₂ e
2024 Vintage:	1,678,463 tCO ₂ e
2025 Vintage:	263,288 tCO ₂ e

¹ <https://www.engineeringforchange.org/solutions/product/zama-zama/#:~:text=The%20Zama%20Zama%20is%20a,reflective%20grade%20of%20stainless%20steel>

Total in PI1-K2C²: 830,642 tCO₂e

Total in PI2-WB³: 873,384 tCO₂e

Total in PI3-VH⁴: 237,725 tCO₂e

1.2 Audit History

Audit type	Period	Program	Validation/verification body name	Number of years
Validation	08-November-2021	VCS	TÜV NORD CERT GmbH	-
Verification	20-August-2021 to 09-February-2022	VCS	Carbon Check India (Pty) Ltd	0.47
Verification	10-February-2022 to 31-January-2023	VCS	Carbon Check India (Pty) Ltd	0.97
Verification	01-February-2023 to 31-July-2023	VCS	Carbon Check India (Pty) Ltd	0.47
Verification	01-August-2023 to 31-January-2024	VCS	SustainCERT	0.47
Verification	01-February-2024 to 31-July-2024	VCS	SustainCERT	0.47
Verification	01-August-2024 to 24-January-2025	VCS	SustainCERT	0.48

1.3 Sectoral Scope and Project Type

² Project Instance 1 – Kruger 2 Canyons

³ Project Instance 2 - Waterberg

⁴ Project Instance 3 - Vhembe

Sectoral scope ⁵	03 – Energy Demand
Project activity type	Type II – Energy efficiency improvement projects

1.4 Project Proponent

Organization name	TASC SA (PTY) LTD
Contact person	Shelley Estcourt
Title	CEO
Address	22 Jamieson Road, Rondebosch, South Africa, 7700
Telephone	+27 (0) 82 579 9611
Email	shelley@tasc.je

1.5 Other Entities Involved in the Project

TASC SA (PTY) LTD. engaged with Implementation Partners for each PI.

For PI1-K2C and PI3-VH

Organization name	Kruger to Canyons Biosphere Region Non-Profit Company (K2C BR NPC)
Role in the project	Instance implementation partner
Contact person	Marie-Tinka Uys
Title	Chief Operations Officer
Address	K2C Nodal Centre, Zandspruit Bush & Aero Estate, Hoedspruit, South Africa, 1380
Telephone	+27 (0) 82 551 7261
Email	info@kruger2canyons.org

For PI2-WB

Organization name	Mogalakwena Training (Pty) Ltd
Role in the project	Instance implementation partner

⁵ 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>

Contact person	Peter Coombes
Title	Chief Executive Officer
Address	357 Hartbees Street, Waterkloof Ridge, Pretoria, South Africa, 0181
Telephone	+27 (0)83 576 4287
Email	peterc@kwenatraining.co.za

1.6 Project Start Date

Project start date	PI1-K2C: 20-August-2021 PI2-WB: 03-September-2021 PI3-VH: 27-March-2023
Justification	The project start date is the date on which the first ICS device was distributed as this is the first date on which the project started generating GHG reductions. This date is reflected separately for each instance.

1.7 Project Crediting Period

Crediting period	Ten years, fixed
Start and end date of first or fixed crediting period	20-August-2021 to 19-August-2031

1.8 Project Location

The Grouped Project and the Project Instances are located within the geographic boundaries of the Republic of South Africa (Figure 1). A description of the boundaries for PI1-K2C can be found in the latest version of the PDD in Section 1.12, for PI2-WB can be found in Section 3.4.3 of the first monitoring report titled “1st Monitoring Report: Fuel

Efficient Cooking in South Africa”⁶, and for PI3-VH is described in Section 3.3.3 of the third monitoring report titled “3rd Monitoring Report: Fuel Efficient Cooking in South Africa”⁷.

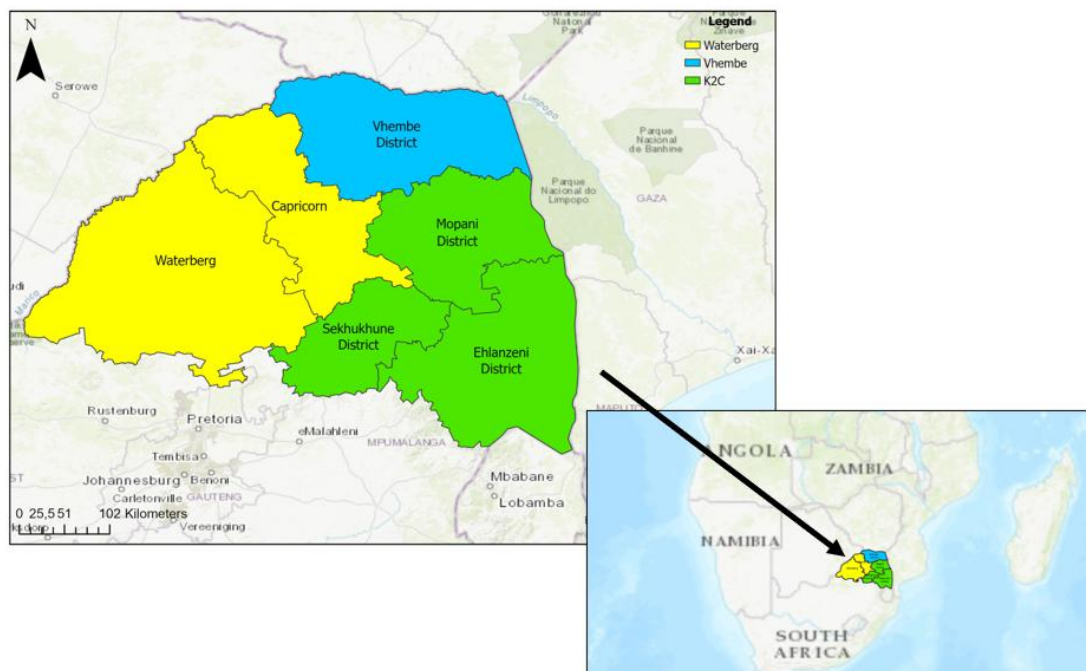


Figure 1 The Grouped Project is located within the Republic of South Africa. The three project instances, PI1-K2C (green), PI2-WB (yellow), and Vhembe (blue), spans the Limpopo Province and the northern District of the Mpumalanga Province.

All PIs currently included in the GP are within the geographic borders of South Africa (Figure 1). All three PIs can be classified as being:

1. Within the hot- and temperate- interior climatic regions
2. Within the Limpopo and Mpumalanga Provinces of South Africa

1.9 Title and Reference of Methodology

Type (methodology, tool or module).	Reference ID, if applicable	Title	Version
Methodology	VMR0006	Methodology for Installation of High Efficiency Firewood Cookstoves	1.1

⁶ 1st Monitoring Report: Fuel efficient cooking in South Africa, Project ID: 2505, Date of issue: 07-02-2022

⁷ 3rd Monitoring Report: Fuel efficient cooking in South Africa v2.0; 21 November 2023.

CDM Guideline	CDM Guideline	Sampling and surveys for CDM project activities and programmes of activities ⁸	4
Tool	CDM Tool19	Demonstration of additionality of microscale project activities ⁹	9
Tool	CDM Tool30	Calculation of the fraction of non-renewable biomass ¹⁰	3

1.10 Double Counting and Participation under Other GHG Programs

1.10.1 TASC hereby declares that the carbon credits generated under this monitoring period will not be registered, claimed, or used in any other greenhouse gas (GHG) programs, environmental credit schemes, or offset mechanisms. These credits are exclusively allocated to VCS 2505 and will not be sold, transferred, or retired under any other registry or programme.

1.10.2 No Double Issuance

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

☐ Yes ☒ No

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

1.10.3 Registration in Other GHG Programs

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

☐ Yes ☒ No

If yes, provide the registration number and all relevant details including the date of project inactivity in the other GHG program.¹¹

⁸ Available at: [https://cdm.unfccc.int/sunsetcms/storage/contents/stored-file-20151023152925068/Meth_GC48_\(ver04.0\).pdf](https://cdm.unfccc.int/sunsetcms/storage/contents/stored-file-20151023152925068/Meth_GC48_(ver04.0).pdf)

⁹ Available at: <https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-19-v9.pdf>

¹⁰ Available at: <https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-30-v3.0.pdf>

¹¹ The requirement to provide the date of project inactivity only applies to projects which request registration or crediting period renewal under the VCS Program on or after 1 January 2025.

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

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

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

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

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

The GP contributes to sustainable development through the distribution of fuel-efficient improved cookstoves (ICS) to local communities in South Africa, who rely on baseline open-fire wood-fueled cooking. The ICS disseminated under this GP is based on rocket stove design principles, which reduce GHG emissions from biomass burning through improved combustion efficiency of wood fuel and decreased wood fuel consumption. The ICSs directly decrease wood fuel demand and reduce the pressure on the ecosystem from wood cutting within the project boundary. A 30-50% saving of firewood, when compared to three-stone fire cooking, has been reported in certain models.¹² The time spent by, especially by women and children foraging for wood fuel is reduced.

From the Priorities listed in the Sustainable Development Goals Country Report 2019 – South Africa¹³, this project will contribute to the SDG priorities in the following ways:

a) Social sustainability

- Health benefits due to reduced exposure to air pollution from biomass burning.
- Time saved on wood harvesting can be used to engage in economic driven activities.
- Reduced accidental burn risk.
- Preservation of wood resources can reduce the risk of intercommunal and/or inter-ethnic conflict over resources.

b) Economic sustainability

- Reduced wood fuel consumption results in savings on firewood purchases and/or travel costs to acquire resources.
- Time saved from wood fuel harvesting can be used in economic driven activities.
- Employment of local people throughout the manufacturing, distribution and monitoring of the project.

c) Environmental sustainability

- Reduce GHG emissions.
- Reduce wood cutting which leads to deforestation and loss of biodiversity. Promote sustainable ecosystems and ecological balance.
- Protection of vegetation ensures better maintenance of water table levels, prevents soil erosion, flash flooding and maintenance of watersheds.

¹² <https://www.engineeringforchange.org/solutions/product/zama-zama/#:~:text=The%20Zama%20Zama%20is%20a,reflective%20grade%20of%20stainless%20steel>

¹³ http://www.statssa.gov.za/MDG/SDGs_Country_Report_2019_South_Africa.pdf

- Decreased household exposure to biomass burning emissions and improvement of general air quality.
- Reduced run-away fire risk when compared to conventional open-fire cooking methods.

Table 1: Sustainable Development Contributions

Row number	SDG target	SDG indicator	Net impact on SDG indicator	Current project contributions	Contributions over project lifetime
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1)	3.0	Number of households reporting improved indoor and ambient air quality due to reduced smoke emissions	Implemented activities to decrease	The distribution of ICS during this monitoring period results in reduction in exposure to indoor air pollutants associated with biomass fuel based traditional cooking.¹⁴ Across the GP, 88% of project households, or 678,839 total (771,128*0.88), reported a reduction in smoke while cooking on the project ICS vs. the baseline fire in this monitoring period.¹⁵ The calculations and reported reductions are based on the habit surveys from all three PIs (PI1-K2C, PI2-WB, and PI3-VH) and the average value is reported.	To date, 678,839 households reported a reduction in smoke while cooking on the project ICS vs. the baseline fire.
2)	13.0	Tonnes of greenhouse gas emissions avoided or removed	Implemented activities to increase	During this monitoring period, the project has reduced 1,941,751 tCO ₂ e during the monitoring period.	To date, the project has prevented the release of 7,411,918 tCO ₂ e into the atmosphere through the distribution of 771,128 ICS.

¹⁴ Stove thermal efficiency and emissions interim test report. 2013. University of Johannesburg., SeTAR Centre.

¹⁵ Habit surveys were carried out as part of the monitoring plan. Please see 2505_MRV6_pKPT_K2C/Vhembe/Waterberg_v1.0.xlsx

3)	7.0	Number of households with access to clean fuels and technology	Implemented activities to increase	By distributing ICS, the project has increased the number of households with access to efficient, modern technology for cooking and enables more efficient use of available energy sources.	By distributing ICS, the project has increased the number of households with access to affordable, reliable and modern energy services to 771,128 households.
4		12.0	Domestic fuel consumption	During this monitoring period, the project has reduced domestic fuel consumption in project households by an average of 3.12 t/HH/yr (Average of $B_{y,savings}$ across the three PIs ¹⁶)	To date, the project has reduced domestic non-renewable woodfuel consumption in project households by an average of 2.35 t/HH/yr (Average of $B_{y,savings}$ across MP1, MP2, MP3, MP4, MP5 and MP6 for the three PIs. ¹⁷)

¹⁶ Household wood fuel use measurements as part of the household surveys were carried out as part of the monitoring plan. Please see cell C87, ER Survey Tab, 2505_MRV6_ER_Calcs_Forecast_v1.0.xlsx

¹⁷ Please see cell C89, ER Survey Tab, 2505_MRV6_ER_Calcs_v1.3.xlsx

1.13 Commercially Sensitive Information

N/A, there is no commercially sensitive information included in the MR.

2 SAFEGUARDS AND STAKEHOLDER ENGAGEMENT

2.1 Stakeholder Engagement and Consultation

2.1.1 Stakeholder Identification

N/A, the stakeholder makeup has not changed since validation.

2.1.2 Stakeholder Consultation and Ongoing Communication

Ongoing consultation	Ongoing consultations are conducted in the form of community meetings held by the monitoring teams.	
Date(s) of stakeholder consultation	2024/06/18	K2C
	2024/07/16	Vhembe
	2024/07/24	Vhembe
	2024/07/25	K2C
	2024/07/26	K2C
	2024/07/28	Vhembe
	2024/08/03	Vhembe
	2024/08/03	Vhembe
	2024/08/06	Vhembe
	2024/08/06	Vhembe
	2024/08/08	Waterberg
	2024/08/12	Waterberg
	2024/08/13	K2C
	2024/08/14	K2C
	2024/08/14	Vhembe
	2024/08/15	Vhembe
	2024/08/15	Vhembe
	2024/08/15	Vhembe
	2024/08/16	Vhembe
	2024/08/16	Vhembe
	2024/08/16	Vhembe
	2024/08/16	Vhembe
	2024/08/20	K2C

	2024/08/21	K2C
	2024/08/21	Waterberg
	2024/08/21	K2C
	2024/08/22	K2C
	2024/08/22	K2C
	2024/08/22	K2C
	2024/08/22	K2C
	2024/08/29	K2C
	2024/08/29	Waterberg
	2024/09/05	K2C
	2024/09/05	K2C
	2024/09/06	K2C
	2024/09/06	Vhembe
	2024/09/18	Waterberg
	2024/09/19	K2C
	2024/09/25	Vhembe
	2024/09/26	K2C
	2024/09/27	K2C
	2024/10/02	Vhembe
	2024/10/03	K2C
	2024/10/03	K2C
	2024/10/08	Vhembe
	2024/10/08	Vhembe
	2024/10/09	Waterberg
	2024/10/09	Vhembe
	2024/10/09	Vhembe
	2024/10/10	Vhembe
	2024/10/17	K2C
	2024/10/20	K2C
	2024/10/24	K2C
	2024/11/08	Waterberg
	2024/11/09	Waterberg
	2024/11/14	Waterberg
	2024/11/18	Vhembe
	2024/11/18	Vhembe
	2024/11/20	Waterberg
	2024/11/20	Waterberg
	2024/11/20	Waterberg
	2024/11/26	Waterberg
	2024/11/29	K2C
	2024/11/29	K2C

	2024/12/09 Waterberg ¹⁸
Communication of monitored results	N/A, there was no communication of monitored results to the beneficiaries.
Consultation records	Ongoing community engagement details are captured using a cloud-based data collection app on smartphones (i.e. SurveyCTO) by filling in a pre-programmed form. Data is stored on a server and can be exported in Excel sheets. Excel raw data is provided in the supplied Excel sheet titled “2502_Community_Meetings_MR6”.
Stakeholder input	The community sensitisation meetings were conducted in the prevalent language of the region, namely Sepedi, isiTsonga and Tshivenda. General feedback/comments received by the communities were also captured in the SurveyCTO form and is presented in the “2502_Community_Meetings_MR6” excel sheet¹⁹. In general, feedback from these meetings is positive towards the stove. The communities recognize how the stove can save them time in collecting wood and in cooking, as well as reducing the amount of wood needed to cook with. None of the comments received during the monitoring period are related to the design of the project, and the design has therefore remained unchanged during this monitoring period.

2.1.3 Free, Prior, and Informed Consent

N/A, the project does not affect property rights in any way.

2.1.4 Grievance Redress Procedure

Beneficiaries are made aware of the grievance procedure at sensitization events, where the grievance process is explained. Additionally, they may also follow the normal tribal route where beneficiaries log the grievance with their tribal leader. The leader will then inform the monitoring teams who will then log and deal with the grievance accordingly.

In order for a grievance to be logged, the beneficiaries can contact TASC through the provided contact details on the cookstove “How to guide”. They may also contact the monitoring staff.

¹⁸ Column A in the “2502_Community_Meetings_MR6” excel sheet.

¹⁹ Column AD in the “2502_Community_Meetings_MR6” excel sheet.

Depending on the nature of the grievance, either monitoring staff can deal with the grievance directly, or TASC project development employees can address the grievance.

TASC's grievance procedure ensures all grievances are received, responded to, and attempted to be resolved within a reasonable time period, taking into account culturally appropriate conflict resolution methods.

No grievances were received during this monitoring period (MR6).

2.1.5 Public Comments

N/A, no further public comments were received outside of the formal public commenting period.

2.2 Risks to Stakeholders and the Environment

2.2.1 Management Experience

Having developed numerous domestic energy projects under CDM, Verra and Gold standard for Global Goals, as well as other projects in the AFOLU sector under Verra, TASC's management team possesses substantial expertise in the design and implementation of community-based carbon projects. TASC has a strong track record in the distribution of improved cookstoves and sustained community engagement across rural areas in sub-Saharan Africa. The team brings together a multidisciplinary group of professionals with backgrounds in environmental science, carbon project development, community development, and monitoring and evaluation.

TASC has worked closely with local communities throughout the entire project lifecycle—from early-stage planning and baseline data collection to stove distribution, training, and follow-up support. Over the years, TASC and the implementing partners have built a strong understanding of what it takes to introduce new household energy technologies in rural settings, both from a technical and social perspective.

Community engagement is central to TASC's approach. The monitoring team regularly engages with tribal authorities, ward councilors, and other local leaders to ensure the project aligns with community needs and expectations. These relationships have also helped us host cooking demonstrations, run public information sessions, and build trust among stove users.

Where additional expertise was needed, such as during the project's early feasibility assessment, TASC worked with established partners like Promethium Carbon, whose support has been instrumental in ensuring the project's technical and methodological robustness.

TASC also understands the value of local knowledge and have recruited community monitors from the project areas to help with stove distribution, training, and follow-up monitoring. This local presence has been key to maintaining strong community ties and ensuring smooth implementation.

Through this mix of experienced internal staff, trusted partnerships, and targeted recruitment, TASC has built a capable and responsive team able to manage the project effectively and stay closely connected to the communities we serve. Thus, we work with our implementation partners, Kruger to Canyons Biosphere Region Non-Profit Company and Mogalakwena Training (Pty) Ltd, who have a well-established footprint in the local communities and have been working in the communities for numerous years.

According to the guidelines, “If a new entity is now involved in project design or implementation, demonstrate the management experience of such entities”, No new organizations are involved in this project for the monitoring period.

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 dissemination of cookstoves poses no natural or human-induced risks to stakeholders' wellbeing.
Risks to stakeholder participation	No risk identified	Participation is voluntary and the dissemination of cookstoves poses no risk to stakeholders.
Working conditions	No risk identified	Employees are protected through their employment contracts and the South African Employment Act.
Safety of women and girls	No risk identified	The dissemination of cookstoves poses no risk to the safety of woman and girls.
Safety of minority and marginalized groups, including children	No risk identified	The dissemination of cookstoves poses no risk to marginalized groups.
Pollutants (air, noise, discharges to water, generation of waste, and release of hazardous materials and chemical pesticides and fertilizers)	No risk identified	The dissemination and use of cookstove do emit pollutants, however at a lesser extent than the baseline devices. Thus, the project does not pose a risk in this regard.

2.3 Respect for Human Rights and Equity

2.3.1 Labor and Work

Risks identified ²⁰		Mitigation or preventative measure(s) taken
Discrimination	No risk identified.	TASC has a policy in place to prevent discrimination and harassment of any kind ²¹ .
Sexual harassment	No risk identified.	TASC has a policy in place to prevent discrimination and harassment of any kind ²² .
Gender equity in labor and work	No risk identified.	TASC is an equal opportunity employer and does not discriminate against any protected characteristic ²³ .
Forced labor	No risk identified.	Neither TASC nor any of its affiliates will, directly or through its subsidiaries, enter into any of the excluded activities specified in the Exclusion lists provided in the TASC ESG Handbook. This includes the Exclusion list of the European Development Finance Institutions of which includes forced labor and child labor within the exclusion list ²⁴ .
Child labor	No risk identified.	Neither TASC nor any of its affiliates will, directly or through its subsidiaries, enter into any of the excluded activities specified in the Exclusion lists provided in the TASC ESG Handbook. This includes the Exclusion list of the

²⁰ 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.

²¹ TASC ESG Handbook p18-44.

²² TASC ESG Handbook p18-44.

²³ TASC ESG Handbook p18-44.

²⁴ TASC ESG Handbook p18-44.

		European Development Finance Institutions of which includes forced labor and child labor within the exclusion list ²⁵ .
Human trafficking	No risk identified.	Neither TASC nor any of its affiliates will, directly or through its subsidiaries, enter into any of the excluded activities specified in the Exclusion lists provided in the TASC ESG Handbook. This includes the Exclusion list of the European Development Finance Institutions of which includes Human trafficking.

2.3.2 Human Rights

N/A, the project does not impact human rights negatively.

2.3.3 Indigenous Peoples and Cultural Heritage

N/A, the project does not impact rights or heritage of indigenous peoples.

2.3.4 Property Rights

N/A, the project does not impact property rights.

2.3.5 Benefit Sharing

N/A, the project does not impact property rights.

2.4 Ecosystem Health

N/A, no risks were determined during validation.

2.4.1 Rare, Threatened, and Endangered species

N/A, the project does not threaten any rare or endangered species.

2.4.2 Introduction of species

N/A, the project does not involve any planting activities.

2.4.3 Ecosystem conversion

N/A, the project is not an ARR, ALM, WRC or ACoGS project.

²⁵ TASC ESG Handbook p18-44.

3 IMPLEMENTATION STATUS

3.1 Implementation Status of the Project Activity

Three PIs have been implemented under the Grouped Project during this monitoring period.

The total number of ICS distributed in each instance are:

Project Instance	Number of ICS distributed during this monitoring period	Total number of ICS distributed
PI1-K2C	-n/a	334,747
PI2-WB	19,257 + 591 = 19,848	316,523
PI3-VH	13,571 + 215 = 13,786	119,858
Total	33,634	771,128

Operation of the Project Activities during the monitoring period

There were no changes to the project, the project proponent, or entities during the monitoring period.

As described in the previous monitoring report²⁶, community and project support teams have been deployed across all three PIs during this monitoring period. These teams, members of which are referred to individually as 'monitors', have been employed to support and encourage the widespread adoption and use of the ICS in the PIs.

Cooking habits are passed down through generations, are influenced by tradition and religious beliefs and are formed around the tools, energy sources and technologies available. With household device projects, it is quite normal for adoption and usage to increase over time, as end-users become more familiar with the technology and start to recognize its benefits. People do not tend to make an instant switch to a new technology; adoption takes time. ICS were distributed progressively over time.

Enabling optimal stove adoption in the communities and decreasing open-fire cooking after ICS distribution requires an understanding of the end-user journey and factors that may limit or encourage stove adoption. To this end, the community and support teams are deployed to educate communities on stove use and its benefits, and responsible resource use, as well as engage and survey communities to understand the local practices and promote project participation. The primary focus of this team is pre- and post-distribution sensitisation (which includes education and demonstrations), with a secondary focus on household surveys to measure stove adoption and inform the project process.

The community and project support teams are tasked with engaging with the project communities post-distribution with the goal of increasing stove uptake and encouraging continuous usage of the project stoves. They are responsible for arranging the appropriate permissions with the Traditional Authorities (TAs), and planning and executing community

²⁶ 3rd Monitoring Report: Fuel efficient cooking in South Africa v2.0; 21 November 2023.

engagements. In addition, the teams are tasked with conducting internal and compliance monitoring through household surveys.

The teams engage with the participating communities through various stakeholder engagement platforms including community meetings, pop-up stands at popular places, school engagements, combined meetings with other social and environmental projects in the region, radio interviews, and engagement through social media (e.g. TikTok). Household surveys are also conducted to resolve any data discrepancies, for internal monitoring and project feedback, as well as for compliance surveys.

Monitors are hired from the local communities allowing the teams to engage in a culturally appropriate manner and serve as the first point of contact in the grievance mechanism.

The behavioural science involved in adopting clean cooking practices is dependent on the capability, motivation, and opportunity to use the stove. Understanding the journey map of a cookstove user enables us to support recipients continually to overcome the barriers to adoption. Taking a behavioural approach to complement the traditional approach of monitoring addresses aspects such as thinking automatically, thinking socially, and thinking with mental models. The behavioural approach aims to define and diagnose problems, design the support to be contextually relevant, implement and evaluate the implementation, adapt and finally redefine and analyse the challenges to the adoption of ICS.

3.2 Deviations

3.2.1 Methodology Deviations

No methodology deviations were applied during this monitoring period.

3.2.2 Project Description Deviations

This Project Description Deviation is included due to an omission of the Implementation Partner details in Section 1.6 of the PDD.

Project Implementation Partners are described in the PDD under No.3.16.3 in Section 2.2 of the PDD. Future instances may include other Implementation Partners, which will be included in the relevant future monitoring reports. Both entities were involved from the relevant PI start dates, (i.e. 20 August 2021 for PI1-K2C, 27 March 2023 for PI3-VH, and 3 September 2021 for PI2-WB). This Project Description Deviation is included due to an omission of the Implementation Partner details in Section 1.6 of the PDD.

The Implementation Partner for PI3-VH is the same as for PI1-K2C.

The two entities involved are:

For PI1-K2C and PI3-VH:

Organization name	Kruger to Canyons Biosphere Region Non-Profit Company (K2C BR NPC)
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Role in the project	Implementation Partner — PI1-K2C
Contact person	Marie-Tinka Uys
Title	Chief Operations Officer
Address	K2C Nodal Centre, Zandspruit Bush & Aero Estate, Hoedspruit, South Africa, 1380
Telephone	+27 (0)82 551 7261
Email	info@kruger2canyons.org
Website	www.kruger2canyons.org

For PI2-WB:

Organization name	Mogalakwena Training (Pty) Ltd
Role in the project	Implementation Partner — PI2-WB
Contact person	Peter Coombes
Title	Chief Executive Officer
Address	357 Hartbees Street, Waterkloof Ridge, Pretoria, South Africa, 0181
Telephone	+27 (0)83 576 4287
Email	peterc@kwenatraining.co.za mailto:info@kruger2canyons.org

3.3 Grouped Projects

Three PIs were implemented during the monitoring period namely, PI1-K2C, PI2-WB, and PI3-VH. In all three PIs, the same ICS technology was distributed to local communities identified as relying on baseline open-fire wood-fueled cooking methods. The Rocketworks Zama Zama rocketstove was distributed by TASC and the relevant PI Implementation Partners.

Eligibility Criteria for New Devices Distributed in Existing Instances

The distribution of ICS in the existing three PIs (i.e. PI1-K2C²⁷, PI2-WB²⁸ and PI3-VH²⁹) during this monitoring period meets the eligibility criteria for the inclusion into the Grouped Project, as demonstrated below:

No	Eligibility Criterion	Required condition of Project Instances	Evidence provided and applicability to ICS distributed in PI1-K2C, PI2-WB and PI3-VH in this monitoring period
1	Project Instances (PIs) must meet the applicability conditions set out in the applied methodology.	Each new PI must demonstrate compliance with the applicability conditions set out in the employed methodology: VMR0006.	All newly distributed stoves adhere to the applicability conditions in the VMR0006 methodology as demonstrated in section 3.3.1 of this report.
2	Use the technologies or measures specified in the project description.	Only ICS that conform with the GP description are to be distributed in the project. The ICS will be chosen to deliver a level of service at least equivalent to the baseline appliance.	The manufacturer's technology description. ^{30, 31} All newly distributed ICS were the Rocket Works Zama Zama rocket stove. The ICS delivers a level of service at least equivalent to the baseline appliance as evidenced in the technology description.
3	Apply the technologies or measures in the same manner as specified in the project description.	The ICS distributed in the PIs will adhere to the GP description and replace biomass burned in the baseline scenario.	a) The manufacturer's technology description describes the applicability of the ICS technology to be distributed in PI1-K2C, PI2-WB and PI3-VH. b) End users were asked to state their source of energy

²⁷ PI1-K2C was included in the project description document titled: "Fuel Efficient Cooking in South Africa" v5.0, 03-March 2022.

²⁸ PI2-WB was included in the document titled: "1st Monitoring Report: Fuel efficient cooking in South Africa" v4.0; 14 June 2022.

²⁹ PI3-VH was included in the document titled: "3rd Monitoring Report: Fuel efficient cooking in South Africa" v2.0; 21 November 2023.

³⁰ SeTAR Centre. 2013 Stove Thermal Efficiency and Emissions Interim Test Report- RocketWorks Wood Stove.

³¹ BECT. 2015. Stove Thermal Efficiency Test Report- Rocket Works Zama Zama

			and baseline appliance at the point of distribution and during the project monitoring. c) This information is stored in the monitoring and data collection database.
4	Are subject to the baseline scenario determined in the project description for the specified project activity and geographic area.	All new PIs will be implemented only in regions within the geographic borders of South Africa subject to the same baseline scenario determined in Section 3.4 of the latest version of the Project Description.	a) GPS/location data captured from each end user, and stored in the monitoring and data collection database demonstrate the location of the newly distributed ICS in all three PIs within South Africa. b) All three PIs are subject to the same baseline scenario described in Section 3.4 of the latest version of the Project Description as identified and demonstrated by baseline surveys.³²³³³⁴
5	Have characteristics with respect to additionality that are consistent with the initial instances for the specified project activity and geographic area.	All new PIs will use the activity method for demonstration of additionality and of: Step 1: Regulatory Surplus There is no government mandated programme or policy in host country of this project ensuring the distribution of new project activity instances. Step 2: Positive List The inclusion of new project activity instances will comply with the positive list as it	There is no government mandated programme or policy in South Africa ensuring the distribution of new project activity instances or fuel efficient cookstoves. 1. All three PIs comply with the positive list in the methodology and satisfies criterion 1 as it meets all the applicability conditions of the methodology. 2. The End User Agreements confirm that the PIs “installs or distributes stoves at zero

³² Kok, L. 2021. Field Baseline Report – Waterberg. Fuel Efficient Cooking in South Africa.

³³ Kok, L. 2021. Field Baseline Report – Kruger 2 Canyons. Fuel Efficient Cooking in South Africa.

³⁴ Kok, L. 2023. Field Baseline Report – Vhembe. Fuel Efficient Cooking in South Africa.

		satisfies criterion 1 where it meets all the applicability conditions of the methodology. 1. Where the project activity installs or distributes stoves at zero cost to the end-user and has no other source of revenue other than the sale of GHG credits, the project activity shall be deemed additional. 2. Project activities that are implemented as part of government schemes or are supported by multilateral funds cannot be considered additional even if the stoves are distributed free of cost or at a highly subsidized rate and hence are not eligible to use this methodology. PIs under the GP will not result in the diversion of official development assistance.	cost to the end-user and has no other source of revenue other than the sale of GHG credits”³⁵ The PIs are not implemented as part of a government scheme nor are they supported by multilateral funds. This is evidenced through Agreements with investors (confidential parts of the document may be redacted). The CME confirms that no PI will result in the diversion of official development assistance.
6	Where a capacity limit applies to a project activity included in the project, no project instance shall exceed such limit. Further, no single cluster of project activity instances shall exceed the capacity limit, determined as follows: Each project activity instance that exceeds one percent of the capacity limit shall be identified.	The VMR0006 methodology does not contain a capacity limit.	A capacity limit does not apply under the VMR0006 methodology.

³⁵ An example of the End-User Agreement is submitted alongside this Monitoring Report

	- Such instances shall be divided into clusters, whereby each cluster is comprised of any system of instances such that each instance is within one kilometre of at least one other instance in the cluster. Instances that are not within one kilometre of any other instance shall not be assigned to clusters. - None of the clusters shall exceed the capacity limit and no further project activity instances shall be added to the project that would cause any of the clusters to exceed the capacity limit.		
7	Occur within one of the designated geographic areas specified in the project description.	a) New project activity instances will be located within the geographic boundaries of South Africa and defined in the instance description document. b) GPS/location data captured from each end user will demonstrate the location of the project and of each PI.	a) The geographic boundary of all newly distributed ICS is demonstrated to be within South Africa as evidenced by b). b) The GPS/location data captured from each end user demonstrating the location of the stoves distributed withing the PIs are provided. The GPS/location information is stored in the monitoring and data collection database.
8	Comply with at least one complete set of eligibility	Compliance of new PIs will be evaluated exclusively against	All newly distributed ICS comply with the full set of eligibility

	criteria for the inclusion of new project activity instances. Partial compliance with multiple sets of eligibility criteria is insufficient.	the eligibility criteria listed in this table.	criteria for the inclusion under the existing project activity instances as described in this table and Table 2 of the PDD.
9	Be included in the monitoring report with sufficient technical, financial, geographic, and other relevant information to demonstrate compliance with the applicable set of eligibility criteria and enable sampling by the validation/verification body.	New PIs will be described in the monitoring report with sufficient technical, financial, geographic, and other relevant information to demonstrate compliance with the applicable set of eligibility criteria and enable sampling by the validation/verification body. Monitoring data of PIs will be stored in the monitoring database, which will also allow for sampling by the validation/verification body. Evidence of relevant information such as local stakeholder engagements, baseline surveys³⁶ and applicable provisions will be included when submitting for PI validation at verification.	The evidence relevant to local stakeholder engagements, baseline surveys and applicable provisions was submitted alongside this Monitoring Report and at validation of the instance inclusion. Complete descriptions of the three existing PIs are included in the PDD, the first Monitoring Report Section 3.4 and the third Monitoring Report Section 3.3. Monitoring data for all stoves distributed across the GP is provided to the VVB at verification.
10	Be validated at the time of verification against the applicable set of eligibility criteria.	New PIs will be submitted for validation against the applicable set of eligibility criteria at the time of verification.	No new PIs were included in this monitoring period. All news stoves have been distributed in the pre-existing instances, more specifically, Waterberg (PI2-WB) and Vhembe (PI3-VH).

³⁶ Desktop or field baseline surveys will be conducted at the PI level and will include quantitative survey on biomass fuel used for cooking and a fNRB survey in the PI boundary. Where a desktop or field baseline survey cannot be performed at the PI level, a conservative national default fNRB value may be applied.

11	Have evidence of project ownership, in respect of each project activity instance, held by the project proponent from the respective start date of each project activity instance (i.e., the date upon which the project activity instance began reducing or removing GHG emissions).	New PIs will demonstrate ownership by the project proponent, from the start date of the PI. Project ownership, as described in Section 1.7 of the latest version of the PDD, is applicable to all PIs included in this GP.	Project ownership of the Grouped Project, which includes all PIs, is demonstrated in Section 1.7 of the latest version of the PDD. This is confirmed as being with the Coordinating/ Managing Entity (CME) of the GP, which is TASC SA (Pty) Ltd. For all existing PIs, the End User Agreement contains the unique serial number that is embossed onto each ICS and are signed by the end user at the point of distribution. The End User Agreement includes the statement: “I understand that I have received the stove free of charge and that, in order to cover the costs of the stove, TASC SA (Pty) Ltd will claim the CO₂ emissions reductions from the stove and sell these as carbon credits” All newly distributed ICS are unique in the project boundary demonstrated by the unique serial numbers that are recorded as part of the data collected at the point of distribution. As per section 3.6.1 of the VCS Standard, the End User Agreement is “<i>An enforceable and irrevocable agreement with the holder of the statutory, property or contractual right in the plant, equipment or process that generates GHG emission reductions and/or removals</i>”
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			<i>which vests project ownership in the project proponent.”</i>
12	Have a start date that is the same as or later than the grouped project start date.	New PIs will have a start date that is the same as or later than the GP start date. Distribution of the efficient cookstoves in the respective PIs will begin at the start date of the GP, or later. Distribution data including distribution dates will be collected and stored on the distribution database. The sale of the first device marks the start date.	The date of distribution for all newly distributed ICS, which is later than the grouped project start date, is included in the distribution database provided with this monitoring report.
13	Be eligible for crediting from the start date of the instance through to the end of the project crediting period (only).	New PIs will be eligible for crediting from the start date of the instance through to the end of the project crediting period (only). New PIs will be eligible for crediting from the start date of the instance through to the end date of the project crediting period on 19 August 2031.	All newly distributed ICS in this monitoring period are eligible for crediting from the distribution date (which is after the respective PI start dates) until the end of the project crediting period on 19 August 2031.

3.3.1 Evidences of Compliance to Eligibility criterion 1

Table 3: Applicability of Methodology- VMR0006

No	Methodology Applicability Criterion	Project Compliance During this Monitoring Period
1	Project activities shall be implemented in domestic premises or in community-based kitchens.	a) The project ensures the distribution of ICS to households or in community-based kitchens only. Evidenced by the manufacturer's technology

		description.³⁷ All newly distributed ICS are the RocketWorks' "Zama Zama" fuel efficient cookstoves which are designed specifically for domestic premises. b) Household or community-based kitchen information, including GPS coordinates and the recipient's details will be collected at point of distribution which will be kept in the PI monitoring database.
2	The project stove shall have specified high-power thermal efficiency of at least 25% per the manufacturer's specifications and shall exclusively use woody biomass and can be single pot or multi-pot; in case of project stove replacing fossil fuel baseline stove, it shall exclusively use renewable biomass.	a) The ICS distributed in this project has a thermal efficiency of at least 25%. The manufacturer's specification from RocketWorks for the Zama Zama rocket stove indicates a thermal efficiency of 38.3%. To ensure that stoves remain above the 25% efficiency threshold equation 5 is applied to estimate a reduction in stove efficiency: $\eta_{\text{new},i,y} = \eta_p \cdot (DF_n)^{y-1} \cdot 0.94$ $\eta_{\text{new},i,y} = 0.3637$ for stoves distributed in this monitoring period, $\eta_{\text{new},i,y} = 0.3600$ for stoves older than one but younger than two years old, $\eta_{\text{new},i,y} = 0.3564$ for stoves older than two but younger than three years old, and $\eta_{\text{new},i,y} = 0.3529$ for stoves older than three years but younger than four years old. b) End-users will be asked to state their source of energy at the point of distribution. c) This information will be stored in the monitoring database.
3	Both 'Projects' and 'Large Projects' can use the methodology.	The project size is allowed for the GP and PIs. The total ERs estimated ex-ante from PI1-K2C, PI2-WB and PI3-VH over the crediting period are 5,262,443; 5,325,057 and; 4,039,305 tCO₂e respectively, and is therefore defined as a "Large Project" according to the guidelines set out in the VMR0006 methodology. The PIs therefore comply with the GP and methodology requirements.

³⁷ SeTAR Centre. 2013 Stove Thermal Efficiency and Emissions Interim Test Report - RocketWorks Wood Stove.

4	Non-renewable biomass has been used in the project region since 31 December 1989, using survey methods or referring to published literature, official reports or statistics; and	Non-renewable biomass has been used in South Africa, the geographic boundary of the GP since 31 December 1989. Evidence was provided at validation of all three PIs.
5	For the specific case of biomass residues processed as a fuel (e.g. briquettes, wood chips), it shall be demonstrated that: a) It is produced using exclusively renewable biomass (more than one type of biomass may be used). b) The consumption of the fuel should be monitored during the crediting period and c) Energy use for renewable biomass processing (e.g. shredding and compacting in the case of briquetting) may be considered as equivalent to the upstream emissions associated with the processing of the displaced fossil fuel and hence disregarded	Not applicable. The ICS is distributed as an energy efficiency measure to replace stoves under the baseline stove scenario of burning non-renewable biomass. The baseline fuel information will be collected on the distribution data collection app at the point of distribution.
6	The Project Design Document shall explain the proposed method for distribution of project devices including the method to avoid double counting of emission reductions such as unique identifications of product and end-user locations (e.g. programme logo)	In order to avoid double counting of emission reductions through the method of distribution, each cookstove has a unique identifier number and the distribution of each stove is logged onto a database which includes unique information for each recipient (i.e. National identification number, geographic coordinates, etc.). Each PI will have system for avoiding double counting with data being collected via a smartphone app (where possible), or via paper forms, including: a) Date of distribution b) A unique serial number on each technology c) GPS coordinates of the end-user (where possible)

		Available end-user data: name, phone number, address/physical location, ID number. All data will be backed up physically in case of outage
7	The Project Design Document shall also explain how the proposed procedures prevent double counting of emission reductions, for example to avoid that project stove manufacturers, wholesale providers or others claim credit for emission reductions from the project devices.	The End User Agreement confirms that the ownership rights of the ER/VCUs generated by the PI reside with the CME. The signature of each end user confirming their understanding of this agreement will be collected at the point of distribution. The End User Agreement will be in English and translated into a local language where required. If necessary, it will be read out to the End User. Each ICS will have a serial number, made to order by the manufacturer, to uniquely identify it. All rights to distribute the delivered stoves and claim the resultant emissions reductions belong to the PP. The GP will not include any PI that has been rejected by another GP, or CPA-DDs of any other GHG programs. Each PI will include a statement on the uniqueness of the Project and by listing other similar activities (from other GHG programme registries) that are taking place within the project boundary to demonstrate its uniqueness.

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	B_{old}
Data unit	Tonnes/year
Description	Annual quantity of woody biomass that would have been used in the household in the absence of the project activity to generate useful thermal energy equivalent to that provided by the project devices.
Source of data	Calculated according to options stated in ‘Determination of quantity of firewood consumed in absence of project activity’ as per options in Section 4.4 in the PDD. Based on Field Baseline surveys conducted by TASC for each PI ^{38 39 40}
Value applied	5.49 for PI1-K2C 5.00 for PI2-WB 3.98 for PI3-VH
Justification of choice of data or description of measurement methods and procedures applied	This parameter shall be determined at the Project Instance level. Values have been approved during instance inclusion reviews.
Purpose of data	Calculation of emission reductions in Equations 3 & 6.
Comments	Parameter B _{old} once determined shall remain fixed for the entire crediting period. Where charcoal is used by the baseline device, a default wood to charcoal conversion factor of 6 kg of firewood per kg of charcoal may be used in line with paragraph 35 of AMS II.G, version 11.

Data / Parameter	f_{nrb,b,y}
Data unit	Fraction
Description	Fraction of woody biomass that can be established as non-renewable biomass.
Source of data	Calculated based on the CDM TOOL 30 “Calculation of the fraction of non-renewable biomass” v3.0 for all PIs
Value applied	0.89 for PI1-K2C 0.99 for PI2-WB

³⁸ Kok, L. 2021. Field Baseline Report – Waterberg. Fuel Efficient Cooking in South Africa. TASC.

³⁹ Kok, L. 2021. Field Baseline Report – Kruger 2 Canyons. Fuel Efficient Cooking in South Africa. TASC

⁴⁰ TASC. 2023. Field Baseline Report – Vhembe_v1.0. Fuel Efficient Cooking in South Africa.

	0.88 for PI3-VH
Justification of choice of data or description of measurement methods and procedures applied	This parameter shall be determined at the Project Instance level. Calculated based on the CDM TOOL30 "Calculation of the fraction of non-renewable biomass" v3.0
Purpose of Data	Calculation of emission reductions.
Comments	

Data / Parameter	EF_{WF,CO2}
Data unit	tCO ₂ e/TJ
Description	CO ₂ emission factor of biomass that is substituted or reduced.
Source of data	VMR0006 methodology default: ⁴¹ IPCC default for wood fuel
Value applied	112
Justification of choice of data or description of measurement methods and procedures applied	Default
Purpose of Data	Calculation of emission reductions.
Comments	

Data / Parameter	EF_{WF,non-CO2}
Data unit	tCO ₂ e/TJ
Description	Non-CO ₂ emission factor of biomass that is substituted or reduced.
Source of data	VMR0006 methodology default: ⁴² IPCC default for wood fuel
Value applied	26.23
Justification of choice of data or description of measurement methods and procedures applied	Default
Purpose of Data	Calculation of emission reductions.

⁴¹ Available at: <https://verra.org/methodology/vmr0006-methodology-for-installation-of-high-efficiency-firewood-cookstoves/>

⁴² Available at: <https://verra.org/methodology/vmr0006-methodology-for-installation-of-high-efficiency-firewood-cookstoves/>

Comments	
Data / Parameter	η_p
Data unit	Fraction
Description	Efficiency of ICS at the start of project activity
Source of data	University of Johannesburg SeTAR Centre test report on Rocket Works' Zama Zama Stove; February 2013 ⁴³
Value applied	38.3%
Justification of choice of data or description of measurement methods and procedures applied	This parameter shall be determined at the Project Instance level.
Purpose of Data	Calculation of $\eta_{new,i,j}$ in Equation 5, ex-ante.
Comments	

4.2 Data and Parameters Monitored

Grouped Project

Data / Parameter	$N_{y,i,j}$
Data unit	Number
Description	Number of project devices of type i and batch j operating during year y
Source of data	ER Calculation Sheet "Summary" tab PI1-K2C: Cell D5 PI2-WB: Cell E5 PI3-VH: Cell F5
Description of measurement methods and procedures to be applied	The total number of devices in operation compared to the total number of distributed (according to the monitoring database) will be surveyed. Devices in operation in the sampled group will be counted during each monitoring period to derive an attrition rate (expressed as a percentage) and this percentage deduction will be applied to the total number of devices operating.

⁴³ SeTAR Centre. 2013. Stove Thermal Efficiency and Emissions Interim Test Report – RocketWorks Wood Stove.

	Measured directly or based on a representative sample. Sampling standard shall be used for determining the sample size to achieve 90/10 confidence precision according to the latest version of Standard for sampling and surveys for project activities and programme of activities. Alternatively, simplified approach proposed in option (b) under section 8.4 in the VMR0006 version 1.1 may be used for determining the minimum sample size in which case compliance with 90/10 confidence precision is not obligatory.
Frequency of monitoring/recording	At least once every two years
Value monitored	PI1-K2C = 301,272 PI2-WB = 284,871 PI3-VH = 107,872
Monitoring equipment	Survey form
QA/QC procedures to be applied	Data from the monitoring survey will be collected at least biennially and applied to the emission reductions calculations during that monitoring period. Where the required level of precision is not met either additional surveys may be completed, or the lower bound value applied.
Purpose of the data	Calculation of emission reductions in Equation 2
Calculation method	
Comments	Proportion of operational stoves obtained from the survey is multiplied by the total commissioned stoves to arrive at this value.

Data / Parameter	$\eta_{\text{new, l,j}}$
Data unit	Fraction
Description	Efficiency of the device of each type l and batch j implemented as part of the project activity.
Source of data	Measurements at project facility
Description of measurement methods and procedures to be applied	The methodology allows for 5 ways of measuring this parameter, as follows: i. Conduct WBT test on a sample of three improved cookstoves with three tests conducted for each stove. The test can be carried out by project proponents by themselves or stove manufacturers or other third parties.

	ii. Efficiency to be tested is high-power thermal efficiency. The high-power thermal efficiency is the average of the Cold Start and Hot Start phases⁴⁴. iii. The average of all results for each device type/model and batch shall be taken as the efficiency for each device type and batch. iv. If the standard deviation of the test results indicated above is very small and 90/10 precision requirement is met (in this case, the value of the t-distribution for 90 per cent confidence shall be used instead of Z value), the efficiency determined is acceptable, otherwise more sample tests would be required until 90/10 precision is met. v. Efficiency of the improved cookstoves can also be estimated ex-ante using equation 5 where loss in efficiency per year is calculated, and therefore this parameter does not need to be monitored. Step v is applied during this monitoring period (using methodology equation 5), meaning this parameter does not need to be monitored and the calculated approach is adopted.
Frequency of monitoring/recording	Annually
Value monitored	Stoves less than 1 year old = 0.3637 Stoves more than 1 year old and less than 2 years old = 0.3600 Stoves more than 2 years old and less than 3 years old = 0.3564 Stoves more than 3 years old and less than 4 years old = 0.3529
Monitoring equipment	ER calculation sheet
QA/QC procedures to be applied	Data will be collected annually and applied to the emission reductions calculations during that monitoring period.
Purpose of the data	Calculation of emission reductions in Equation 3
Calculation method	Equation 5
Comments	See emission reductions calculation sheet for details
Data / Parameter	$B_{y=1,new,i,j,survey}$
Data unit	Tonnes

⁴⁴ CDM Methodologies Panel Clarification on water boiling test under AMS II.G (SSC_752)

Description	Quantity of woody biomass used by project devices in tonnes per device of type i .
Source of data	Monitoring survey
Description of measurement methods and procedures to be applied	Minimum sample size of each type i and batch j should be in line with the latest version of Standard for sampling and surveys for project activities and programme of activities or guidelines provided in section 8.4 option (b). Determined in the first year of the introduction of the devices (e.g. during the first year of the crediting period, $y=1$) through measurement campaigns at representative households and/or sample survey. Sample surveys to estimate this parameter, that are solely based on questionnaires or interviews (i.e. that do not implement measurement campaigns) may only be used if the following conditions are satisfied. (i) Baseline cookstoves have been completely decommissioned and only improved cookstoves are exclusively used in the project households; (ii) If multiple devices are used in the project, it is possible from the results of the survey questions to clearly differentiate the quantity of firewood being used by each device. In other words, if more than one device, or another device that consumes firewood, are in use in project households, then the sample survey needs to distinguish the quantity of firewood used by the project device and the other devices that use firewood.
Frequency of monitoring/recording	N/A
Value monitored	N/A
Monitoring equipment	N/A
QA/QC procedures to be applied	Data collected will be applied to the emissions reduction calculations during that monitoring period. Where the required level of precision is not met either additional monitoring activities may be completed, or the lower bound value applied.
Purpose of the data	Calculation of emission reductions in Equation 3
Calculation method	Equation 4
Comments	Monitoring $B_{y=1,new,i,j,survey}$ is optional as calculating $B_{y,savings,i,j}$ can be estimated using either Equation 3 or 4 as per the methodology. The option to use Equation 3 was selected and therefore $B_{y=1,new,i,j,survey}$ is not applicable.

	Equation 3: $B_{y,savings,i,j} = B_{old} \times [1 - (\eta_{old}/\eta_{new,i,j})]$, where η_{old} is the efficiency of the baseline cookstove and $\eta_{new,i,j}$ is determined through Equation 5 in the methodology.
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Data / Parameter	μ_y
Data unit	Fraction
Description	Adjustment to account for any continued use of pre-project devices during the year y
Source of data	Monitoring survey
Description of measurement methods and procedures to be applied	Minimum sample size of each type i and batch j should be in line with the guidelines provide in section 8.4 option (b) of the methodology. This parameter should be monitored using one of the following methods: • If the baseline cookstoves are decommissioned and no longer used, as determined by the monitoring survey its value is 0 and $B_{old,adjusted}$ is equal to B_{old} • If both the improved cookstove and baseline cookstoves are used together then surveys shall be conducted to record the average continued operation of baseline cookstoves in a sample of households. The surveys should be designed to capture the cooking habits and stove usage of households in the region, including quantification of use of baseline cookstoves, by formulating questions and/or collecting evidence to determine the frequency of usage of both the improved cookstoves and baseline cookstoves. For example, if there were 3 baseline cookstoves in a household and it was determined during the survey that use of one of them continues during the crediting period then a conservative adjustment factor of 0.33. Another example would be the case where there was only one baseline cookstove per household and its use during the project period continues along with the improved cookstove to meet 25% of the cooking needs of the household in which case the adjustment factor will be 0.25. Another example would be to interview the household and have them estimate the time of usage of the baseline cookstoves and improved cookstove on an average day.⁴⁵

⁴⁵ For example, if a household reports to be preparing 3 meals in a day using 35 minutes each, out of which one meal is prepared on the baseline stove, then cooking time on secondary stove and project stove would be 0.33 and 0.66 respectively.

Frequency of monitoring/recording	At least once every two years
Value monitored	PI1-K2C = 0.209 PI2-WB = 0.086 PI3-VH = 0.022
Monitoring equipment	Survey form
QA/QC procedures to be applied	Data from the monitoring survey will be collected at least once every two years and applied to the emission reductions calculations during that monitoring period. Where the required level of precision is not met either additional surveys may be completed or the lower bound value applied. Equipment used for KPTs are bought new before the onset of each round of monitoring. For this MP the moisture meters and scales were bought on the 30th of May 2024 and do not need calibration. These scales can measure up to 300kg in increments of 0.1kg and is in accordance with the OIML R76 standard⁴⁶. The moisture meters used can measure moisture levels for wood from 6% to 44% with an accuracy of 2%.
Purpose of the data	Calculation of emission reductions in Equation 6
Calculation method	1. Using Equation 3, the expected amount of the baseline fuel consumption that would continue to be used on a project ICS is calculated, in a project scenario where there is no continued baseline fire usage. This is called “B_{used}” in the survey worksheets and is calculated using results of Equation 3 ($B_{old} - B_{y,savings}$) 2. B_{used} is then subtracted from the total household fuel consumption, as determined by KPTs, for each monitored household in the project scenario. This determines each households’ residual fuel usage on the baseline fire. 3. This residual household fuel usage is then divided by the total household fuel usage to obtain a per-household parameter proportion u_y 4. This value from all monitored households is then averaged to obtain the project parameter proportion u_y
Comments	-

⁴⁶ https://www.oiml.org/en/files/pdf_r/r076-2-e93.pdf

Data / Parameter	η_{old}
Data unit	Fraction
Description	Efficiency of baseline stove
Source of data	- Methodology default 0.1 or 0.2 - Surveyed prior to implementation of project activity
Description of measurement methods and procedures to be applied	In most cases, PIs will use option A under the methodology, but options B-D may be utilized if required: - A default value of 0.1 shall be used if baseline device is a three-stone fire using firewood (not charcoal), or a conventional device with no improved combustion air supply or flue gas ventilation, that is without a grate or a chimney; - A default value of 0.2 shall be used for other types of devices. - If more than one type of baseline device is being replaced in the project region, weighted average values (taking the amount of woody biomass consumed by each device as the weighting factor) shall be used. - If this parameter is surveyed, project promoters may use simplified guidelines stated under Option (b) in Section 4.4 in the PDD for arriving at the minimum sample size
Frequency of monitoring/recording	Fixed for each individual household at the time of project implementation
Value applied	0.1 (for baseline 3-stone fires and open fires) 0.2 (for other baseline stove types)
Monitoring equipment	-
QA/QC procedures to be applied	The baseline surveys for PI1-K2C, PI2-WB, and PI3-VH shows predominant use of wood fuel amongst households in the first three PI Project Boundaries. PIs will expressly target households that cook predominantly on an open fire, hence the application of Option A as the ex-ante parameter value. In all cases, the baseline device replaced within each household will be captured at the point of ICS distribution and recorded in the monitoring database. Ex-post values will be adjusted accordingly.
Purpose of data	Calculation of emission reduction in Equation 3.

Calculation method	-
Comments	All distribution data will be collected and stored in the Monitoring Database

Data / Parameter	Life Span
Data unit	Years
Description	Operating lifetime of project device
Source of data	Manufacturer's specification
Description of measurement methods and procedures to be applied	Device manufacturers will provide a statement on the expected operational lifetime of the device ⁴⁷
Frequency of monitoring/recording	Once at point of distribution
Value applied	5
Monitoring equipment	-
QA/QC procedures to be applied	Stoves will have an expected operational lifetime and this value is used for ex-ante emissions reductions calculations. The actual operation of stoves is monitored via parameter $N_{y,i,j}$ and therefore any stove found to be in operation beyond its expected lifetime may still be credited during the PI crediting period. Likewise, stoves found not to be in operation prior to the end of their lifetime will be discounted.
Purpose of data	Calculation of emissions reductions
Calculation method	-
Comments	-

Data / Parameter	NCV_{biomass}
Data unit	TJ/tonne
Description	Net calorific value of the non-renewable woody biomass, renewable biomass, briquettes or pellets used in project devices

⁴⁷ Rocket Works Stove Longevity. 2021.

Source of data	Default
Description of measurement methods and procedures to be applied	PIs will adopt the methodology (IPCC) default for wood fuel, 0.0156 TJ/tonne, based on the gross weight of the wood that is 'air-dried' may be used if fuel used in project device is woody biomass/renewable biomass.
Frequency of monitoring/recording	Annual
Value applied	0.0156
Monitoring equipment	None
QA/QC procedures to be applied	Measurement in laboratories according to relevant national/international standards based on dry biomass. Consistency of the measurements to be checked by comparing the measurement results with measurements from previous years, relevant data sources (e.g. values in the literature, values used in the national GHG inventory) and default values by the IPCC.
Purpose of data	Calculation of emission reduction
Calculation method	-
Comments	-

4.3 Monitoring Plan

4.3.1 Sampling Plan

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

Sampling Design

a. Objectives & Reliability Requirements

Sampling activities are defined at the Grouped Project-level and apply here to the execution of the sampling plan presented here to assess parameter values in Project Instances.

In accordance with the Methodology and the Standard, samples will be calculated on a 90/10 for individual PIs on an annual basis, or 95/10 confidence/precision basis for groups of PIs or sampling on a biennial basis.

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

Parameter values may be estimated by sampling in accordance with Sampling Standard for a single or a group of PIs. A single sampling plan covering a group of PIs is justified when either the homogeneity of included PIs relative to the parameters of interest can be demonstrated or the differences among the included PIs is taken into account in the sample size calculation. Sampling was conducted per PI.

Sampling and surveys to determine parameter $N_{y,i,j}$ and μ_y were conducted for each PI included in this GP.

b. Target Population

The target population is the combined unique entries of ICS users by PI in the monitoring database from which the sample is being drawn. The target population for the monitoring is 771,128 households that received an ICS.

c. Sampling Method

For each survey, the sampling method is determined by using a random sample of the total population of distributed ICS from records generated in the monitoring database and based on the precision requirements listed above, and as required by the methodology and guidance in the Sampling Standard. The “RAND” function is used to randomise the database from which then the required sample is selected.

d. Sample Size

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

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

The formula used for sampling are as follows:

i. For proportion based parameters:

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

Where:

n	= Sample size
N	= Total number of households (640,000)
p	= Our expected proportion (0.50)
1.645	= Represents the 90% confidence required
0.1	= Represents the 10% relative precision ($0.1 \times 0.5 = 0.05 = 5\%$ points either side of p)

i. For mean based parameters:

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

Where:

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

Using the CDM Survey Sample Calculator v03.1⁴⁸, the sample size for $N_{y,i,j}$ and μ_y was determined for a proportion parameter:

Project Instance	PI1-K2C	PI2-WB	PI3-VH
Expected proportion, p	0.82	1	0.85
Confidence level	90%	90%	90%
Z multiplier	1.645	1.645	1.645
Relative precision	10%	10%	10%
Population size, N	334,747	316,523	119,858
Predicted sample size, n	60	33	48
Actual Sample Size	100	102	103

⁴⁸ Available at: <https://cdm.unfccc.int/Reference/Guidclarif/index.html>

The expected proportion was informed by the previous monitoring and verification process for this GP (MP5), which was concluded in July 2024. However, to satisfy the minimum sample size according to Section 8.4 Option (b) of the VMR0006 v1.1 methodology, i.e., Project target population > 1000: Minimum sample size 100, random samples of more than a 100 were selected. 150 samples were selected in PI1-K2C, PI2-WB and PI3-VH, respectively. As not all the beneficiaries are available to be surveyed and to participate in KPT's the end number of sample households monitored during this MP was 107, 104 and 104 for PI1-K2C, PI2-WB and PI3-VH respectively. There were 7, 1, and 1 outliers determined in the KPTs in the sample set for PI1-K2C, PI2-WB and PI3-VH respectively. The parameter μ_y was determined for the same sample set.

e. Sampling Frame

The Sampling Frame will be the monitoring database which may contain information from multiple PIs and therefore allows for sampling to be taken per PI or as a group of PIs. Each PI was sampled separately in this monitoring period.

The dates that project surveys (KPTs and Habit Surveys) were conducted for each project instance are as follows:

PI1-K2C: 28-10-2024 to 28-11-2024.

PI2-WB: 21-10-2024 to 13-01-2025.

PI3-VH: 07-01-2025 to 24-01-2025.

4.3.2 Data Recording

Field-based monitoring activities to determine monitored parameter values was a field survey including a qualitative questionnaire and quantitative household wood fuel use measurements.

Data was recorded directly onto a smartphone-based app designed for the purpose.

Once collected, data was submitted directly from the field to the TASC SA Carbon Project Manager for QA/QC and entry into the Monitoring Report.

4.3.3 Organizational Structure

The TASC SA Carbon Project Manager will have overall responsibility for the implementation of the monitoring plan.

Data collection was conducted by a dedicated monitoring team of trained individuals, either from TASC SA or the Project Instance Implementer using a survey questionnaire.

4.3.4 Quality Assurance/Quality Control

In order to minimize sampling errors, such as non-responses and errors, the field team practiced over-sampling from the population to ensure a total number of respondents that meets the required level of precision and minimum sample size requirements. This will ensure the integrity of the sample group and maintains the randomness of participant selection. All sample groups will be re-selected for each monitoring period / year, as appropriate for the parameter in question.

If the required level of precision is not achieved, then further surveys may be completed or the lower bound value adopted in the calculations.

Where a survey may not be completed, or where there is a non-response, the reasons shall be clearly documented in the survey questionnaire.

Further data quality checks are completed on completion of the monitoring activities and all data with possible erroneous entries are either flagged for check with hard copies and correction or discarded from the monitoring database.

4.3.5 Analysis

Completed survey questionnaires data was collected by the monitoring team and delivered to the TASC SA Carbon Project Manager for analysis. These were checked through for errors and completeness and compiled into this monitoring report.

Monitoring surveys were conducted across all PIs between October 2024 and January 2025. The minimum sample size of 100 households as per VMR0006 Section 8.4 Option (b) were selected to survey for the proportion parameter $n_{y,i,j}$ and μ_y . Each stove in the distribution database was a number from 1 to x, where x = the count of stoves in each PI. A random sample was extracted from each PI's distribution database using the Excel Sampling function in the Data Analysis Tool.⁴⁹ The survey database, which includes the GPS coordinates of each survey is submitted with this monitoring report.

Analysis of survey questions for parameter $n_{y,i,j}$, indicated a proportion of 0.93, 1.00, and 0.93 for PI1-K2C, PI2-WB, and PI3-VH, respectively, of disseminated stoves are being used⁵⁰. These values will be adjusted to 0.9 for all three instances. To determine this proportion, stove recipients were asked if they use their stoves. Interviewees who responded "No" to the question "Do you use your stove" was considered a non-user, and those who responded "Yes", were considered a user. The consistent and strategic monitoring activities have gradually transformed cookstove adoption through a cumulative approach. By persistently engaging communities through meetings, demonstrations, and stakeholder

⁴⁹ <https://www.dummies.com/article/technology/software/microsoft-products/excel/how-to-sample-data-in-excel-152117/>

⁵⁰ See ER Calculation Sheet "ER Survey" tab. PI1-K2C: Cell D23, PI2-WB: Cell E23, PI3-VH: Cell F23

engagements, the monitoring teams have systematically built trust and understanding. Each interaction has encouraged genuine interest, normalizing the ICS technology as a practical solution. The layered strategy of education, technical demonstration, and responsive community engagement has created a powerful ripple effect, resulting in progressive increases in stove usage across different regions.

Beneficiaries in the Fuel Efficient Cooking in South Africa project were surveyed to assess the usage rates of the project cookstoves in accordance with Verra guidelines. However, as we recognise that there are uncertainties associated with using a survey-based approach to measuring usage, we strive to adhere to the best practices outlined in the most recent and robust VM0050 methodology. Specifically, when utilising a survey-based approach for quantifying usage, we endeavour to apply the 90% usage rate cap to ensure methodological rigor and conservativeness. This approach is being applied to the grouped project to enhance the accuracy and reliability of the reported usage rates. In this monitoring period, the stove usage rates for all three instances were determined to be over 90%, and hence will be capped at 90%. As per the Correction and Clarifications (Clarification 2) to VM0050 Energy Efficiency and Fuel-Switch Measures in Cookstoves, V1.0, for projects employing surveys, the usage rate is capped at 90% where all of the following customer support actions are undertaken:

- 1) Selection of technologies and fuels that fully meet the cooking needs of the target population, demonstrated by citing robust research or conducting an investigation of cooking practices and attitudes
- 2) Implementation of support activities to assist the target population in effectively operating and maintaining their cookstoves. These may include providing materials (print, in-person, or video on how to operate the cookstove to prepare common local foods, how to troubleshoot common operational issues, and how to make minor repairs (including obtaining necessary replacement parts). All such communications and materials must be provided in local language(s) commonly used in the project area.
- 3) Provision of a commonly used, toll-free communications channel through which the target population can contact the project proponent to access support (e.g., maintenance and repair services).

Demonstration of compliance with the customer support actions:

- 1) To ensure that the improved cookstoves introduced in the project fully meet the cooking needs of the target population, a comprehensive assessment was undertaken through baseline surveys and Kitchen Performance Tests (KPTs). These surveys identified the primary cooking devices and fuels used by households within the project boundary, revealing that open-pit fires and wood are the predominant cooking methods. This evidence confirms that the improved cookstoves align with the needs and practices of the target population

while also addressing broader community challenges, such as reducing the burden of frequent and labour-intensive firewood collection.

In addition to field-based assessments, a desktop feasibility study was conducted by an independent consultant, Promethium Carbon, to evaluate the viability of the proposed grouped project activity before initiating validation and registration processes. Furthermore, a comprehensive literature review was carried out to establish the baseline technologies and fuels commonly used by rural households in northeast South Africa. This review ensured that the improved cookstoves introduced by the project would be appropriate for the local context.

The literature review highlighted that communities within the project boundary are predominantly rural and have low-income levels, leading them to rely on the most affordable fuel sources available, primarily biomass collected from surrounding forests and wooded areas (Makonese et al., 2018). Additionally, these communities typically cook on open fires due to the limited availability and high cost of alternative fuels such as electricity and LPG, particularly in remote rural areas (Matsika et al., 2012).

Based on these assessments, the project has demonstrated that the selected improved cookstoves effectively meet the cooking needs of the target population while also contributing to reduced fuel consumption and improved household energy efficiency.

Demonstration of compliance with implementation of support activities:

To ensure that the target population can effectively operate and maintain their improved cookstoves, TASC has implemented a comprehensive support program led by full-time monitoring personnel. These personnel engage directly with communities through a range of structured activities, including stakeholder meetings, community engagement events, and hands-on cooking demonstrations.

Stakeholder meetings serve as a critical platform for ongoing dialogue between the project team and local leaders, including tribal councils, traditional authorities, and ward councillors. These meetings provide an opportunity to review project progress, address challenges, and refine implementation strategies based on community feedback. This collaborative approach strengthens relationships and ensures the project remains aligned with the needs of its beneficiaries.

Community engagement activities, such as cooking demonstrations and interactive pop-up stands, allow participants to experience the improved cookstoves firsthand. These demonstrations highlight stove functionality, cooking efficiency, and proper maintenance practices while providing an opportunity for beneficiaries to ask questions and share their experiences. The interactive nature of these sessions promotes knowledge transfer and encourages wider adoption of the technology.

In addition to in-person engagement, informational pamphlets are distributed to households upon receiving their improved cookstoves. These pamphlets, provided in local languages commonly spoken in the project area, contain clear guidance on stove operation, maintenance, and troubleshooting. They also include contact details for monitoring personnel and TASC offices, ensuring beneficiaries can easily access support when needed.

By integrating ongoing community engagement, accessible educational materials, and direct communication channels, the project ensures that beneficiaries receive the necessary support to maximise the long-term benefits of the improved cookstoves.

Demonstration of compliance with provision of communication channels:

To ensure that beneficiaries have access to ongoing support, TASC has established multiple communication channels through which the target population can easily contact project representatives for assistance with stove usage, maintenance, and repairs.

Monitoring personnel proactively provide their contact details to local leaders, tribal authorities, and community representatives, ensuring that beneficiaries can reach them directly or through trusted local figures. Additionally, monitors conduct regular follow-up visits to villages where cookstoves have been distributed. These visits serve to assess stove usage through both formal and informal monitoring activities, reinforce proper stove operation, and encourage continued adoption through community meetings and live demonstrations. This direct engagement fosters trust and ensures that beneficiaries feel supported throughout the project's duration.

Further enhancing accessibility, all stove pamphlets distributed to households include the contact details of monitoring personnel and TASC offices. These materials, provided in local languages, ensure that beneficiaries have a clear and easily accessible means of reaching out for support when needed

The survey results meet the precision requirements at 4.5%, 0%, and 4.4% in PI1-K2C, PI2-WB, and PI3-VH, respectively, according to the CDM Survey Sample Calculator v03.1 and shown below.

Project Instance	PI1-K2C	PI2-WB	PI3-VH
Actual sample size	100	102	103
Sample proportion	0.93	1	0.93
Standard error of the proportion	0.0255	0	0.0251
Precision associated with a proportion	0.0420	0	0.0413

Relative precision

4.5%

0%

4.4%

For the analysis of the survey to determine μ_y , the survey results met the precision requirements for mean based parameters at 4.8%, 7.3%, and 5.6% in PI1-K2C, PI2-WB, and PI3-VH, respectively, according to the CDM Survey Sample Calculator v03.1 and shown in the table below. The μ_y values are 0,209, 0,086, and 0,022 for PI1-K2C, PI2-WB, and PI3 VH, respectively⁵¹. The KPT results indicated the mean average wood usage of 1.737, 1.997, and 1.966 t/household/year in PI1-K2C, PI2-WB, and PI3-VH, respectively.

	PI1-K2C	PI2-WB	PI3-VH
Actual sample size	100	102	103
Sample mean	4,759	5,4720	5.3870
Sample standard deviation	1,385	2,4150	1,8370
Standard error of the mean	0.1385	0.2391	0.1809
t-value	1.6604	1.6601	1.6599
Absolute precision	0.2299	0.3969	0.3003
Relative precision	4.8%	7.3%	5.6%

4.3.6 Implementation Plan

The implementation of this monitoring plan is the responsibility of TASC SA and its specifically trained monitoring team. This team comprised local operatives who are conversant in local languages and customs of rural South Africa. Individuals were selected based on their competence and experience for each monitoring activity and trained accordingly.

No incentives were or will be provided for these individuals for the type of data provided, to prevent any conflict of interest.

The Kitchen Performance Test (KPT) Protocol v4 of the Clean Cooking Alliance⁵² was followed to determine the household wood use and the proportion of cooking need still being

⁵¹ See ER Calculation Sheet "ER Survey" tab. PI1-K2C: Cell D24, PI2-WB: Cell E24, PI3-VH: Cell F24

⁵² Bailis, R., Thompson, R., Lam, N., Berrueta, V., Muhwezi, G. & Adams, E. 2018. Kitchen Performance Test (KPT) v4.0. Clean Cooking Alliance. 16p.

met by the baseline device as described in section 5.4 of this document. The KPT is the principal field-based procedure to measure household fuel consumption. The objective of the KPT is to quantify fuel consumption under typical household and stove usage conditions. The protocol is conducted alongside the qualitative habit survey to contextualise fuel consumption and continued baseline stove use practices and to report on the SDG contributions. The KPT measurements, although the best way to understand fuel usage of homes, intrudes on people's daily activities and results have an element of uncertainty as conditions are harder to control in comparison to laboratory-based tests.

Daily fuel consumption is measured through the KPT, which can then be used to determine the daily average fuel and energy consumption per adult equivalent. To facilitate comparison of wood fuel usage across households with different age and gender compositions, the KPT allows for converting household members to adult equivalent units. To minimise interference on the normal household fuel consumption practices, wood was not provided to the households.

The test was performed between October and November 2024. The Data Capturers (DCs) visited each household to explain the purpose of the test and to request the household members' consent to conduct the test. On the first day of the test, the initial weight of the wood in each household's firewood stockpile was measured, as well as three moisture measurements of three individual pieces of wood from the stockpile. On the subsequent days, the households were visited at a time as close as possible to the time of visit on the first day. The remaining firewood stockpile was then weighed to determine the wood consumption in a 24-hour period. The moisture content of the wood in the stockpile was also measured during the visits to be correlated with the following 24-hour period's wood consumption.

Additionally, the monitoring teams are trained to repair stoves and to conduct maintenance on the stoves during their monitoring activities. The monitoring teams are continuously busy with monitoring activities and households are aware of how to contact them in the event that a stove needs repairing or replacement.

5 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

5.1 Baseline Emissions

The methodology does not account for baseline emissions separately but instead quantifies emission reductions as a function of the reduction in the amount of non-renewable biomass fuel consumption in the efficient project stoves as compared to baseline stoves.

5.2 Project Emissions

The methodology does not account for project emissions separately but instead quantifies emission reductions as a function of the reduction in the amount of non-renewable biomass fuel consumption in the efficient project stoves as compared to baseline stoves.

5.3 Leakage Emissions

Leakage (L_y) shall be considered as default 0.95 in accordance with Section 8.3 of the applied methodology VRM0006 v1.1

5.4 GHG Emission Reductions and Carbon Dioxide Removals

Procedure for quantification of net GHG emission reductions and removals

Net GHG emission reductions are calculated by applying Equations 1 and 2 of the VMR0006 v1.1 methodology:

$$ER_y = \sum_i \sum_j ER_{y,i,j} \quad \text{Equation (1)}$$

where:

- i = Indices for the situation where more than one type/model of improved cook stove is introduced to replace three-stone fire
- j = Indices for the situation where there is more than one batch of improved cook stove of type i
- ER_y = Emission reductions during year y in t CO₂e
- $ER_{y,i,j}$ = Emission reductions by improved cook stove of type i and batch j during year y in t CO₂e

and

$$ER_{y,i,j} = B_{y,savings,i,j} \times NCV_{wood\ fuel} \times fNRB_y \times (EF_{wf,CO_2} + EF_{wf,nonCO_2}) \times N_{y,i,j} \times 0.95 \quad \text{Equation (2)}$$

where:

$B_{y,savings,i,j}$	=	Quantity of woody biomass that is saved in tonnes per improved cook stove of type i and batch j during year y
$f_{NRB,y}$	=	Fraction of woody biomass that can be established as non-renewable biomass (fNRB)
$NCV_{wood\ fuel}$	=	Net calorific value of the non-renewable woody biomass that is substituted or reduced (IPCC default for wood fuel, 0.0156 TJ/tonne)
EF_{wf,CO_2}	=	CO ₂ emission factor for the use of wood fuel in baseline scenario (IPCC default for wood fuel, 112 tCO ₂ /TJ)
$EF_{wf,non\ CO_2}$	=	Non-CO ₂ emission factor for the use of wood fuel in baseline scenario (IPCC default for wood fuel, 26.23 tCO ₂ /TJ)
$N_{y,i,j}$	=	Number of improved cook stoves of type i and batch j operating during year y
0.95	=	Discount factor to account for leakage

The quantity of woody biomass saved, $B_{y,savings,i,j}$, due to the implementation of improved cookstoves can be estimated by one of the following options set out in Equations 3 and 4:

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

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

The efficiency of the project stoves can be estimated using Equation 5:

$$\eta_{new,i,y} = \eta_p \times (DF_n)^{y-1} \times 0.94 \quad \text{Equation 5}$$

where

η_p	=	Efficiency of project stove (fraction) at the start of project activity.
$(DF_n)^{y-1}$	=	Discount factor to account for efficiency loss of project cookstove per year of operation (fraction). This value may be based on actual monitoring or based on manufacturer's declaration on expected loss in efficiency or through publicly available literature on relevant industry standards. Alternatively default value of 0.99 efficiency loss per year can be considered.
0.94	=	Adjustment factor to account for uncertainty related to project cookstove efficiency test.

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

$$B_{old,adjusted} = B_{old} \times (1 - \mu_y) \quad \text{Equation 6}$$

where:

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

$$\mu_y = \text{Baseline stove usage factor to account for use of baseline cookstoves along with improved cookstoves.}$$

The quantity of firewood consumed in the absence of the project activity (B_{old}) shall be determined using an estimation of average annual consumption of firewood per household which may be derived using any of the following options:

- Historical Data.
- Baseline Survey of Local Usage.
- Minimum Service Level

Option b) applied in this monitoring period.

A net gross leakage factor of 0.95 is applied to $ER_{y,i,j}$.

The equations above assume that a single baseline stove is replaced by a single project stove.

Only 1 project device will be distributed per household in the project, as evidenced by the monitoring database entries, and so the following equations are not relevant to the calculation of ERs in the project and will not be monitored:

$$B_{old,i,j} = B_{old,HH} \div N_{d,HH} \quad \text{Equation (i)}$$

$$B_{old,HH} = B_{old,p} \times N_{p,HH} \quad \text{Equation (ii)}$$

where

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

For projects opting for $B_{y=1,new,i,j,survey}$, it shall be demonstrated that the consumption of biomass for individual project stoves can be measured exclusive of one another. $B_{y=1,new,i,j,survey}$ was not applicable in this monitoring period.

Project stoves will be implemented to replace non-renewable woody biomass baseline stoves only, so Equations 7 & 8 are not applicable.

Example calculations:

For each Project Instance a study of the PI-level baseline scenario was provided at validation, either from public sources (where such data may be available) or field studies. The following steps were followed to calculate the ERs.

- Applying Equation 6, the quantity of woody biomass being consumed in the baseline scenario (B_{old}) was adjusted ($B_{old,adjusted}$) with the proportion of continued baseline stove usage (μ_y), as determined through the survey campaign.

As part of the survey campaign, Kitchen performance tests (KPTs) were conducted to measure the household wood fuel consumption. The KPTs were conducted according to the KPT Protocol, version 4⁵³. The KPT is the principal field-based procedure to measure household fuel consumption. The primary objective of the KPT is to quantify fuel consumption under typical household and stove usage conditions. This involves a 4-day assessment of overall household fuel use, which automatically accounts for fuel use on all appliances in use in the household. This means that if baseline appliances continue to be used in the project scenario, the usage of fuel on those appliances is accounted for in the KPT. As noted in the KPT Protocol version 4.0: "Because it occurs in the homes of stove users, this type of testing, when conducted carefully, is the best

⁵³ KPT 4.0 March 2018 (cleancooking.org)

way to understand the stove's impact on fuel use and, when complemented with the appropriate surveys, on general household characteristics and behaviours (Lillywhite, 1984; VITA, 1985).” Peer-reviewed literature supports KPTs as an accurate household biomass usage quantification method compared to imprecise household estimates. A recent study by Ventrella et al. (2020), showed good agreement ($R^2 = 0.81$) between the results from the KPT method and in-situ Fuel Use Electronic Logger (FUEL), a sensor-based system that monitors fuel consumption in households. This study found that there were no systematic over- or under-prediction of fuel consumption between the KPT and FUEL.⁵⁴ The KPT is widely used in peer-reviewed literature to determine fuel consumption (including Bailis *et al.* 2007; Berrueta *et al.* 2008).⁵⁵

It is important to note that the baseline scenarios for each Project Instance (PI) included in the Grouped Project were assessed by conducting KPTs in non-, or pre-project households. This is how the baseline wood usage parameter (B_{old}) was determined for both PIs in the registered Project Description. Therefore, conducting KPTs to assess fuel use in the project scenario, in project households, is a like-for-like comparison which ensures the highest level of accuracy in the monitored results.

Applying Equation 3, the expected ex-ante household fuel use can be determined in a situation where the baseline open-fire has been completely decommissioned and replaced by the ICS. Through the KPT surveys, the project scenario fuel use is measured encompassing fuel use in all household cooking devices. The difference between the expected project fuel use and the actual project fuel use in each household can therefore be determined. Where a household's fuel use is in excess of the expected fuel use, the excess is conservatively assumed to be from using the baseline open-fire. The proportion of cooking need still being met by the baseline open-fire is calculated as the excess fuel use ascribed to the baseline device in relation to the total household fuel use. The average proportion is calculated for all the surveyed households to determine μ_y for each PI.

- ii. The assumed reduction in stove efficiency with age was calculated for stoves younger than 1 year, between 1 and 2 years old, between 2 and 3 years old, and between 3 and 4 years using Equation 5. $B_{y,savings,i,j}$ was subsequently calculated with Equation 3 for each PI and stove age category.

⁵⁴ Ventrella, J., Lefebvre, O. & MacCarty, N. 2020. Techno-economic comparison of the FUEL sensor and Kitchen Performance Test to quantify household fuel consumption with multiple cookstoves and fuels. *Development Engineering*. Volume 5:100047. <https://doi.org/10.1016/j.deveng.2020.100047>.

⁵⁵ Bailis, R., Berrueta, V., Chengappa, C., Dutta, K., Edwards, R., Masera, O., Still, D., & Smith, K.R. 2007. Performance testing for monitoring improved biomass stove interventions: experiences of the Household Energy and Health Project. *Energy for Sustainable Development*, Volume 11, Issue 2, Pages 57-70. [https://doi.org/10.1016/S0973-0826\(08\)60400-7](https://doi.org/10.1016/S0973-0826(08)60400-7).

Berrueta, V.M., Edwards, R.D. & Masera, O.R. 2008. Energy performance of wood-burning cookstoves in Michoacan, Mexico, *Renewable Energy*. Volume 33, Issue 5, Pages 859-870, <https://doi.org/10.1016/j.renene.2007.04.016>.

- iii. ER_y per stove was calculated by applying Equation 2 based on one stove per age category in each PI. An $ER_{day,i,j}$ per stove value was then determined by dividing ER_y by 365 days.
- iv. The number of days each stove has been operational since the start of the monitoring period was determined. The sum of the stove days could then be multiplied by the stove usage rate ($n_{y,i,j}$) determined with the Habit Survey for each PI and by $ER_{day,i,j}$ applicable to the stove age category to determine the $\sum ER_{y,i,j}$.

To calculate the annual quantity of ERs, the fixed parameters and example calculations for all three PIs are outlined below. (Note: The values indicated in the table below are not rounded and only the first four decimals are indicated).

Table 2 Example project parameters

Fixed GP Parameters	Unit	Value			Description	Source
EF_{wf,CO_2}	tCO ₂ e/TJ	112			CO ₂ emission factor of biomass that is substituted or reduced.	VMR0006 default
$EF_{wf,non-CO_2}$	tCO ₂ e/TJ	26.23			Non-CO ₂ emission factor of biomass that is substituted or reduced.	VMR0006 default
$NCV_{biomass}$	TJ/tonne of wood	0.0156			Net calorific value of biomass.	VMR0006 default
η_{old}	fraction	0.1 (3-stone and open fires) 0.2 (other baseline stoves)			Efficiency of the baseline cookstove being replaced.	VMR0006 default
η_p	fraction	0.383			Efficiency of project cookstove (fraction) determined at the start of the project activity.	Rocket Works' Zama Zama wood stove; South Africa lab efficiency test (stove model distributed in the first two monitoring periods)
L_y	fraction	0.95			Default leakage adjustment factor.	VMR0006 default
Fixed PI Parameters	Unit	PI1-K2C	PI2-WB	PI3-VH	Description	Source
B_{old}	tonnes/year	5.49	5.00	3.98	Quantity of biomass consumed in baseline.	Field baseline KPT surveys for PI1-K2C, PI2-WB, and PI3-VH

$F_{NRB,y}$	fraction	0.89	0.99	0.88	Fraction of biomass used in baseline scenario, which can be established as non-renewable.	fNRB studies for PI1-K2C, PI2-WB, and PI3-VH
Monitored Parameters	Unit	PI1-K2C	PI2-WB	PI3-VH	Description	Source
μ_y	fraction	0.21	0.09	0.02	Baseline stove usage factor to account for use of baseline cookstoves along with improved cookstoves	Habit surveys for PI1-K2C, PI2-WB, and PI3-VH
$\eta_{y,i,j}$	fraction	0.90	0.90	0.90	Proportion of operational stoves in this monitoring period.	Habit surveys for PI1-K2C, PI2-WB, and PI3-VH

Table 3 Example calculations

For stoves less than 1 year old						
$\eta_{new,y}$	fraction	0.3637	0.3637	0.3637	Efficiency of improved cookstove in year y	Equation 5
$B_{old,adjusted}$	Tonnes/year	4.3426	4,5700	3.8924	Adjusted B_{old} to account the ex-post usage of firewood in baseline cookstoves	Equation 6
$B_{y,savings}$	tonnes/year	3.1484 ($\eta_{old} = 0.1$) 1,9543 ($\eta_{old} = 0.2$)	3.3133 ($\eta_{old} = 0.1$) 2.0566 ($\eta_{old} = 0.2$)	2.8221 ($\eta_{old} = 0.1$) 1.7517 ($\eta_{old} = 0.2$)	The quantity of woody biomass saved in the project scenario.	Equation 3
$ER_{y,l}$	tCO ₂ e/year	5.7403 ($\eta_{old} = 0.1$) 3.5631 ($\eta_{old} = 0.2$)	6.7197 ($\eta_{old} = 0.1$) 4.1710 ($\eta_{old} = 0.2$)	5.0875 ($\eta_{old} = 0.1$) 3.1579 ($\eta_{old} = 0.2$)	ERs generated per stove per year	Equation 2
$ER_{day,l}$	tCO ₂ e/day	0.0157 ($\eta_{old} = 0.1$) 0.0098 ($\eta_{old} = 0.2$)	0.0184 ($\eta_{old} = 0.1$) 0.0114 ($\eta_{old} = 0.2$)	0.0139 ($\eta_{old} = 0.1$) 0.0087 ($\eta_{old} = 0.2$)	ERs generated per stove per day	$=ER_{y,l}/365$
Stove days	days	4602 ($\eta_{old} = 0.1$)	656,367 ($\eta_{old} = 0.1$) 16,663 ($\eta_{old} = 0.2$)	345,368 ($\eta_{old} = 0.1$)	Total number of operational stove days	Distribution database

		0 ($\eta_{old} = 0.2$)		5,398 ($\eta_{old} = 0.2$)		
ER_y (before usage discount)	tCO ₂ e	72.38 ($\eta_{old} = 0.1$) n/a ($\eta_{old} = 0.2$)	12,083.78 ($\eta_{old} = 0.1$) 190.42 ($\eta_{old} = 0.2$)	4,813.84 ($\eta_{old} = 0.1$) 46.70 ($\eta_{old} = 0.2$)	Emission reductions during year y	Equation 1
ER_y (after usage discount)	tCO ₂ e	65.14 ($\eta_{old} = 0.1$) n/a ($\eta_{old} = 0.2$)	10,875.41 ($\eta_{old} = 0.1$) 171.37 ($\eta_{old} = 0.2$)	4,332.45 ($\eta_{old} = 0.1$) 42.03 ($\eta_{old} = 0.2$)	Emission reductions during year y after $\eta_{y,i,j}$ and baseline stove issue discounts applied	=ER _y * $\eta_{y,i,j}$
ER_y per stove (after usage discount)	tCO ₂ e/year	5.1663 ($\eta_{old} = 0.1$) n/a ($\eta_{old} = 0.2$)	6.0477 ($\eta_{old} = 0.1$) 3.7539 ($\eta_{old} = 0.2$)	4.5787 ($\eta_{old} = 0.1$) 2.8421 ($\eta_{old} = 0.2$)	Emission reductions per stove per year after baseline stove usage discounts were applied	= [ER _y (after discounts)/Stove days]*365
For stoves more than 1 and less than 2 years old						
$\eta_{new,y}$	fraction	0.3600	0.3600	0.3600	Efficiency of improved cookstove in year y	Equation 5
B_{old,adjusted}	Tonnes/year	4.3426	4.5700	3.8924	Adjusted B _{old} to account the ex-post usage of firewood in baseline cookstoves	Equation 6
B_{y,savings}	tonnes/year	3.1364 ($\eta_{old} = 0.1$) 1.9302 ($\eta_{old} = 0.2$)	3.3006 ($\eta_{old} = 0.1$) 2.0313 ($\eta_{old} = 0.2$)	2.8113 ($\eta_{old} = 0.1$) 1.7301 ($\eta_{old} = 0.2$)	The quantity of woody biomass saved in the project scenario.	Equation 3
ER_{y,i}	tCO ₂ e/year	5.7183 ($\eta_{old} = 0.1$) 3.5191 ($\eta_{old} = 0.2$)	6.6939 ($\eta_{old} = 0.1$) 4.1195 ($\eta_{old} = 0.2$)	5.0680 ($\eta_{old} = 0.1$) 3.1189 ($\eta_{old} = 0.2$)	ERs generated per stove per year	Equation 2
ER_{day,i}	tCO ₂ e/day	0.0146 ($\eta_{old} = 0.1$)	0.0183 ($\eta_{old} = 0.1$) 0.0113 ($\eta_{old} = 0.2$)	0.0139 ($\eta_{old} = 0.1$) 0.0085 ($\eta_{old} = 0.2$)	ERs generated	=ER _{y,i} /365

		0.0090 ($\eta_{old} = 0.2$)			per stove per day	
Stove days	days	9,246,126 ($\eta_{old} = 0.1$) 74,871 ($\eta_{old} = 0.2$)	25,840,407 ($\eta_{old} = 0.1$) 205,320 ($\eta_{old} = 0.2$)	18,512,253 ($\eta_{old} = 0.1$) 262,137 ($\eta_{old} = 0.2$)	Total number of operational stove days	Distribution database
ER _y (before usage discount)	tCO ₂ e	144,855.98 ($\eta_{old} = 0.1$) 721.87 ($\eta_{old} = 0.2$)	473,901.97 ($\eta_{old} = 0.1$) 2,317.33 ($\eta_{old} = 0.2$)	257,040.55 ($\eta_{old} = 0.1$) 2,239.95 ($\eta_{old} = 0.2$)	Emission reductions during year y	Equation 1
ER _y (after usage discount)	tCO ₂ e	130,370.38 ($\eta_{old} = 0.1$) 649.68 ($\eta_{old} = 0.2$)	426,511.78 ($\eta_{old} = 0.1$) 2,085.60 ($\eta_{old} = 0.2$)	231,336.50 ($\eta_{old} = 0.1$) 2,015.95 ($\eta_{old} = 0.2$)	Emission reductions during year y after $\eta_{y,i,j}$ and baseline stove issue discounts applied	$=ER_y * \eta_{y,i,j} * 0.909$
ER _y per stove (after usage discount)	tCO ₂ e/year	5.1465 ($\eta_{old} = 0.1$) 3.1672 ($\eta_{old} = 0.2$)	6.0245 ($\eta_{old} = 0.1$) 3.7076 ($\eta_{old} = 0.2$)	4.5612 ($\eta_{old} = 0.1$) 2.8070 ($\eta_{old} = 0.2$)	Emission reductions per stove per year after baseline stove usage discounts were applied	$= [ER_y \text{ (after discounts)}/\text{Stove days}] * 365$
For stoves more than 2 and less than 3 years old						
$\eta_{new,y}$	fraction	0.3564	0.3564	0.3564	Efficiency of improved cookstove in year y	Equation 5
B _{old,adjusted}	Tonnes/year	4.3426	4,5700	3.8924	Adjusted B _{old} to account the ex-post usage of firewood in baseline cookstoves	Equation 6
B _{y,savings}	tonnes/year	3.1242 ($\eta_{old} = 0.1$)	3.2878 ($\eta_{old} = 0.1$)	2.8003 ($\eta_{old} = 0.1$)	The quantity of	Equation 3

		1.9058 ($\eta_{old} = 0.2$)	2.0056 ($\eta_{old} = 0.2$)	1.7083 ($\eta_{old} = 0.2$)	woody biomass saved in the project scenario.	
$ER_{y,i}$	tCO ₂ e/year	5.6961 ($\eta_{old} = 0.1$) 3.4747 ($\eta_{old} = 0.2$)	6.6679 ($\eta_{old} = 0.1$) 4.0675 ($\eta_{old} = 0.2$)	5.0483 ($\eta_{old} = 0.1$) 3.0795 ($\eta_{old} = 0.2$)	ERs generated per stove per year	Equation 2
$ER_{day,i}$	tCO ₂ e/day	0.0156 ($\eta_{old} = 0.1$) 0.0095 ($\eta_{old} = 0.2$)	0.0183 ($\eta_{old} = 0.1$) 0.0111 ($\eta_{old} = 0.2$)	0.0138 ($\eta_{old} = 0.1$) 0.0084 ($\eta_{old} = 0.2$)	ERs generated per stove per day	$=ER_{y,i}/365$
Stove days	days	36,661,656 ($\eta_{old} = 0.1$) 70,800 ($\eta_{old} = 0.2$)	21,653,649 ($\eta_{old} = 0.1$) 77,526 ($\eta_{old} = 0.2$)	0	Total number of operational stove days	Distribution database
ER_y (before usage discount)	tCO ₂ e	572,134.71 ($\eta_{old} = 0.1$) 674.00 ($\eta_{old} = 0.2$)	395,575.94 ($\eta_{old} = 0.1$) 863.95 ($\eta_{old} = 0.2$)	-	Emission reductions during year y	Equation 1
ER_y (after usage discount)	tCO ₂ e	514,921.24 ($\eta_{old} = 0.1$) 606.60 ($\eta_{old} = 0.2$)	356,018.35 ($\eta_{old} = 0.1$) 777.55 ($\eta_{old} = 0.2$)	-	Emission reductions during year y after $n_{y,i,j}$ and baseline stove issue discounts applied	$=ER_y * n_{y,i,j} * 0.909$
ER_y per stove (after usage discount)	tCO ₂ e/year	5.1265 ($\eta_{old} = 0.1$) 3.1272 ($\eta_{old} = 0.2$)	6.0011 ($\eta_{old} = 0.1$) 3.6608 ($\eta_{old} = 0.2$)	-	Emission reductions per stove per year after baseline stove usage discounts were applied	$= [ER_y \text{ (after discounts)}] / \text{Stove days} * 365$
For stoves more than 3 and less than 4 years old						
$\eta_{new,y}$	fraction	0.3564	0.3529	-	Efficiency of improved	Equation 5

					cookstove in year y	
B_{old,adjusted}	Tonnes/year	4.3426	4,5700	-	Adjusted B _{old} to account the ex-post usage of firewood in baseline cookstoves	Equation 6
B_{y,savings}	tonnes/year	3.1119 ($\eta_{old} = 0.1$) 1.8812 ($\eta_{old} = 0.2$)	3.2749 ($\eta_{old} = 0.1$) 1.9797 ($\eta_{old} = 0.2$)	-	The quantity of woody biomass saved in the project scenario.	Equation 3
ER_{y,i}	tCO ₂ e/year	5.6737 ($\eta_{old} = 0.1$) 3.4298 ($\eta_{old} = 0.2$)	6.6417 ($\eta_{old} = 0.1$) 4.0150 ($\eta_{old} = 0.2$)	-	ERs generated per stove per year	Equation 2
ER_{day,i}	tCO ₂ e/day	0.0155 ($\eta_{old} = 0.1$) 0.0094 ($\eta_{old} = 0.2$)	0.0145 ($\eta_{old} = 0.1$) 0.0088 ($\eta_{old} = 0.2$)	-	ERs generated per stove per day	=ER _{y,i} /365
Stove days	days	13,115,346 ($\eta_{old} = 0.1$) 64,749 ($\eta_{old} = 0.2$)	4,689,438 ($\eta_{old} = 0.1$) 14,845 ($\eta_{old} = 0.2$)	0	Total number of operational stove days	Distribution database
ER_y (before usage discount)	tCO ₂ e	203,869.28 ($\eta_{old} = 0.1$) 608.43 ($\eta_{old} = 0.2$)	85,330.72 ($\eta_{old} = 0.1$) 163.30 ($\eta_{old} = 0.2$)	-	Emission reductions during year y	Equation 1
ER_y (after usage discount)	tCO ₂ e	183,428.36 ($\eta_{old} = 0.1$) 547.59 ($\eta_{old} = 0.2$)	76,797.65($\eta_{old} = 0.1$) 146.97($\eta_{old} = 0.2$)	-	Emission reductions during year y after n _{y,i,j} and baseline stove issue discounts applied	=ER _y * n _{y,i,j} * 0.909
ER_y per stove (after	tCO ₂ e/year	5.1063 ($\eta_{old} = 0.1$)	5.9775 ($\eta_{old} = 0.1$) 3.6135 ($\eta_{old} = 0.2$)	-	Emission reductions per stove per year	= [ER _y (after discounts)/Stove days]*365

usage discount)		3.0869 ($\eta_{old} = 0.2$)			after baseline stove usage discounts were applied	
Total verifiable ERs	tCO2e	830,642.00	873,384.00	237,725.00	Total ERs generated for the operational stoves during the monitoring period.	= $\sum ER_y$ (Equation 1)

Table 6 Comparison of the MP1, MP2, MP3, MP4, MP5, and MP6 monitored ERs

	MP1 (20/08/2021-09/02/2022)	MP2 (10/02/2022-31/01/2023)	MP3 (01/02/2023-31/07/2023)	MP4 (01/08/2023-31/01/2024)	MP5 (01/02/2024-31/07/2024)	MP6 (01/08/2024-24/01/2025)	Change (MP5 to MP6)	Justification for the difference
PI1 ERs	77,797	607,604	788,710	801,762	756,127	830,642	9.25%	Increased usage rate from MR5 to MR6.
PI2 ERs	26,050	310,583	390,655	573,424	777,014	873,384	11.79%	A lower monitored baseline usage fraction (0.08 in MP6 vs. 0.26 in MP5) resulted in the increase in emission reductions. Furthermore, more stoves were distributed during this monitoring period.

PI3 - ER S	-	-	24,378	149,455	177,624	237,725	33.45%	A lower monitored baseline usage fraction (0.02 in MP6 vs. 0.24 in MP5) resulted in the increase in emission reductions. Furthermore, more stoves were distributed during this monitoring period.
Ave rag e per - ICS ER S	3.883	3.157	3.479	4.141	4.627	5.022	12.91%	The increase in per-ICS ERs for this MP was expected for the following reasons: The continued baseline stove usage factor decreased. The PP and PI Implementers deployed community and project support teams in all three Pls. These permanent teams were established specifically to support and encourage the widespread adoption and use of the ICS amongst end-users. Using multiple stakeholder engagement platforms (described in Section 3.1 above) have led to an increase in use of project ICS. Additionally, distribution of new stoves took place during this monitoring period, leading to more stoves reducing carbon emissions.

Table 7 'A summary of the net GHG ERs for the GP' does not include baseline and project emissions, as the VMRO006 v1.1 methodology states as follows: "This methodology does not determine baseline emissions. It directly quantifies emission reductions based on the reduced consumption of non-

renewable biomass or fossil fuels. The approach is the same as under AMS-II.G.”Therefore, the emissions reductions for each vintage period in MP 6 are included.

Table 7 A summary of the net GHG ERs for the GP

Vintage period	Baseline emissions (tCO ₂ e)	Project emissions (tCO ₂ e)	Leakage emissions (tCO ₂ e)	Buffer pool allocation (tCO ₂ e)	Reductions VCU (tCO ₂ e)	Removals VCU (tCO ₂ e)	Total VCU issuance (tCO ₂ e)
01-August-2024 – 31-December-2024					1,678,463		1,678,463
1-January-2025 – 24-January-2025					263,288		263,288
Total					1,941,751		1,941,751

Table 8 estimated ex-ante GHG emission reductions and carbon dioxide removals and the achieved reductions and removals for MR6

Vintage period	Ex-ante estimated reductions/removals	Achieved reductions/removals	Percent difference	Explanation for the difference
01-August-2024 – 31-December-2024	1,581,895	1,678,463	6.10%	More stoves were distributed during this monitoring period, leading to an increased number of devices earning credits and reducing CO₂ emissions. Total ex-ante stoves: 573,000 Total stoves during MP6: 771,128 Additionally, the monitoring data (survey data) demonstrated that the uy values, particularly in PI2-WB and PI3-VH, decreased significantly. MP6 uy values: PI1-K2C = 0.209 PI2-WB = 0.086 PI3-VH = 0.022
1-January-2025 – 24-January-2025	248,140	263,288	6.10%	
Total	1,830,035	1,941,751	6.10%	

APPENDIX 1: COMMERCIALLY SENSITIVE INFORMATION

N/A. There is no commercially sensitive information.