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2ND MONITORING REPORT: FUEL EFFICIENT COOKING IN SOUTH AFRICA



Document Prepared by TASC SA (PTY) LTD

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1 PROJECT DETAILS

1.1 Summary Description of the Implementation Status of the Project

This is the second 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 10 February 2022 to 31 January 2023.

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. A 30-50% saving of firewood, when compared to three-stone fire cooking, has been reported in certain models¹. The time spent foraging for wood fuel is reduced, saving time for especially women to engage in other economic driven activities.

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

Across the two instances, 326,250 RocketWorks Zama Zama rocket stoves were physically distributed in this monitoring period (MP2). In the first monitoring period (MP1), 116,342 ICS were physically distributed, but 1,626 ICS were not included in the ER calculations due to incorrect data.² The data discrepancies for these 1,626 ICS were resolved during MP2 through the efforts of the monitoring teams deployed in each PI. These ICS have now been included in the MP2 ER calculations, meaning that the total number of ICS counted as ‘distributed’ in this monitoring period is 327,876 (i.e. 326,250 + 1,626).

Since the project start date, a total of 442,592 ICS have been distributed in the GP across all instances.

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

²Only 114,716 ICS were included in the ER reporting in the monitoring report for MP1, i.e., “Fuel Efficient Cooking in South Africa: 1st Monitoring Report v4.0”.

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

GHG emission reductions in this monitoring period:

Total: 918,187 tCO₂e

Total in PI1-K2C³: 607,604 tCO₂e

Total in PI2-WB⁴: 310,583 tCO₂e

1.2 Sectoral Scope and Project Type

Sectoral Scope: 03 – Energy demand

Type II – Energy efficiency improvement projects

The project is a Grouped Project that includes several Project Instances of the same project activity.

1.3 Project Proponent

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

1.4 Other Entities Involved in the Project

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

PI1-K2C

Organization name	Kruger to Canyons Biosphere Region Non-Profit Company (K2C BR NPC)
Contact person	Marie-Tinka Uys

³ Project Instance 1 – Kruger 2 Canyons

⁴ Project Instance 2 - Waterberg

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

PI2-WB

Organization name	Mogalakwena Training (Pty) Ltd
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

1.5 Project Start Date

The start date of the GP is 20 August 2021. The PI start dates are as follows:

Project Instance	Project Instance Start Date
PI1-K2C	20 August 2021
PI2-WB	3 September 2021

1.6 Project Crediting Period

The crediting period for the GP is fixed for 10 years, from 20 August 2021 to 19 August 2031. All PIs are eligible for crediting from the start date of the instance through to the end date of the GP crediting period on 19 August 2031.

Project Instance	Crediting period start date	Crediting period end date
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PI1-K2C	20 August 2021	19 August 2031
PI2-WB	3 September 2021	19 August 2031

1.7 Project Location

The Grouped Project and the Project Instances are located within the geographic boundaries of the Republic of South Africa (Figure 1).

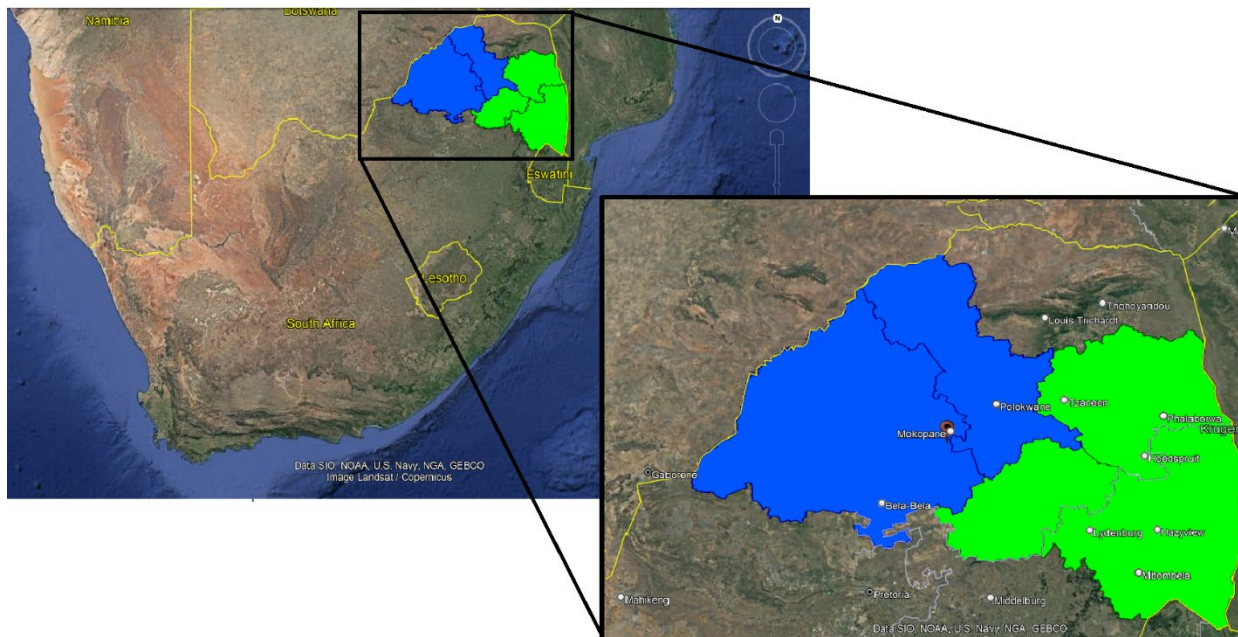


Figure 1. The Grouped Project is located within the Republic of South Africa. The two project instances, PI1-K2C (green) and PI2-WB (blue), spanning the Limpopo and Mpumalanga Provinces, are indicated in the insert.⁵

The coordinates for the two PIs are:

PI1-K2C Hoedspruit: 24.350539 S, 30.9367999 E

PI2-WB Mokopane: 24.1864307 S, 28.9533905 E

1.8 Title and Reference of Methodology

All Project Instances included in this monitoring report follow the VCS Methodology from Sectoral Scope 3 –

⁵ US Dept of State Geographer. Image Landsat/Copernicus. 2020 AfriGIS (Pty) Ltd. Data SIO, NOAA, U.S. Navy, NGA, GEBCO.

- *VMR0006 Methodology for Installation of High Efficiency Firewood Cookstoves v1.1.*^{6 7}

As the VMR0006 methodology v 1.1 is described in Section 1 as a “revision” applying to the CDM small-scale methodology AMS-II. G, “Energy efficiency measures in thermal applications of non-renewable biomass” and that “*Project proponents must apply this methodology revision in conjunction with the latest version of AMS II.G.*”, we refer to version 13.0 of AMS II.G in this monitoring report, which is the latest version.

The VMR0006 methodology v 1.1 also states in Sections 9.1 and 9.2 that “*PROJECT PROPONENTS MUST FOLLOW THE MONITORING PROCEDURES PROVIDED IN CDM METHODOLOGY AMS II.G. VERSION 11*”, we also refer to version 11.1 of AMS II.G in this monitoring report.

The associated tools and guideline documents in the Project Instances in this monitoring report include:

- *CDM Guideline: Sampling and surveys for CDM project activities and programmes of activities, v4*⁸
- *CDM TOOL19: Demonstration of additionality of microscale project activities, v9*⁹
- *CDM TOOL30: Calculation of the fraction of non-renewable biomass v3*¹⁰

All prior and preceding references to the methodology and tools in this monitoring report refer to the respective versions of the documents stated above.

1.9 Participation under other GHG Programs

This is a new project and the Grouped Project and the Project Instances included in this document has not been registered or seeking registration under any other GHG programs.

1.10 Other Forms of Credit

Emissions Trading Programs and Other Binding Limits:

⁶ Available at: <https://verra.org/methodology/vmr0006-methodology-for-installation-of-high-efficiency-firewood-cookstoves/>

⁷ CDM methodology Energy efficiency measures in thermal applications of non-renewable biomass, v13.0. Available at: https://cdm.unfccc.int/filestorage/6/T/O/6TOUCX21D0BHNVRZFWMEKALY94GS7/EB115_repan11_AMS-II.G_v13.0.pdf?t=MHI8cnF1dmVwfDCZbkVj5eQAghWefw5i1YwuO

⁸ Available at: https://cdm.unfccc.int/filestorage/e/x/t/extfile-20151023152925164-Meth_GC48_-ver04.0-.pdf/Meth_GC48_%28ver04.0%29?t=akV8cXVjNnNrfDCCBpv3U-UXoHTmniOSuhTH

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>

The project is not included in an emissions trading program or any other mechanism that includes GHG allowance trading.

Other forms of Environmental Credit

The project has not sought, nor received another form of GHG-related environmental credit.

1.11 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.¹¹ 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 Africa¹², 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 economically 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 economically driven activities.
- Employment of local people throughout the manufacturing, distribution and monitoring of the project.

c) Environmental sustainability

- Reduce GHG emissions.

¹¹ <https://www.engineeringforchange.org/solutions/product/zama-zama/#:~:text=The%20Zama%20Zama%20is%20a,reflective%20grade%20of%20stainless%20steel>

¹² http://www.statssa.gov.za/MDG/SDGs_Country_Report_2019_South_Africa.pdf

- 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 maintains watersheds.
- 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
1)	13.0	Tonnes of greenhouse gas emissions avoided or removed	Implemented activities to increase	By distributing 327,876 ICS during this monitoring period, the project has reduced 918,187 tCO ₂ e during the monitoring period.	To date, the project has prevented the release of 1,022,034 tCO ₂ e into the atmosphere through the distribution of 442,592 ICS.
2)	3.0	Number of households with improved indoor and ambient air quality due to reduced	Implemented activities to increase	The distribution of ICS during this monitoring period results in the reduction of exposure to indoor air pollutants associated with biomass fuel based traditional cooking. ¹³ 73% of project households, or 323,092 total (442,592*0.73), reported a reduction in smoke while cooking on the project ICS vs. the baseline fire in this monitoring period.¹⁴	To date, 323,092 households reported a reduction in smoke while cooking on the project ICS vs. the baseline fire.

¹³ Stove thermal efficiency and emissions interim test report. 2013. University of Johannesburg., SeTAR Centre.

¹⁴ Habit surveys were carried out as part of the monitoring plan. Please see 2505_MRV2_Habit Surveys_v1.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. 327,876 households received ICS during this monitoring period	By distributing ICS, the project has increased the number of households with access to affordable, reliable and modern energy services to 442,592 households.
4)	12.0	Domestic fuel consumption	Implemented activities to decrease	During this monitoring period, the project has reduced domestic fuel consumption by an average of 2.51 t/HH/yr (Average of By,savings across the two PIs)	To date, the project has reduced domestic non-renewable wood fuel consumption by an average of 2.51 t/HH/yr (Average of By,savings across the two PIs))

2 SAFEGUARDS

2.1 No Net Harm

No potential negative environmental or socio-economic impacts have been identified for the project.

2.2 Local Stakeholder Consultation

Local stakeholder consultations were conducted prior to the implementation of the Project Instances following the implementation plan for engaging with local stakeholders outlined in the latest Project Description and in the first Monitoring Report. During this monitoring period, continued stakeholder consultations were conducted for both instances as summarized below:

Procedures or methods used for engaging local stakeholders:

The community members are consulted in sensitisation meetings where the project is described, and the use and maintenance of the stoves is demonstrated. The meetings are carried out pre- and post- distribution.



Procedures or methods used for documenting the outcomes of the local stakeholder communication:

Meeting notes are recorded on a mobile app, including details such as the date and time of the meeting, the location and GPS coordinates, the Traditional Authority consulted in planning the meeting, the number of attendees and notes of what was discussed at the meeting. The consultation meetings include a question-and-answer session. Overall, the reception to the stove and project has been positive. Questions are of a practical nature and include topics such as how to light the stove, how to clean and maintain the stove, and how to feed the fire.

Mechanism for ongoing communication with local stakeholders:

The sensitisation meetings listed above are part of the ongoing communication with local stakeholders. These meetings aim to demonstrate the ICS usage and maintenance, as well as introduce the social-, economic- and environmental benefits of using the ICS and are being held at village level. These meetings are presented in collaboration with the project instance Implementation Partners. The relevant local tribal authorities are consulted during the sensitisation process. Continued engagement with the communities are planned and implemented by TASC and the Implementation Partners throughout the project lifecycle. The contact details of TASC and of the respective implementation partners are provided during the meetings and on the how-to guide distributed with the stoves. No potential negative environmental or socio-economic impacts have been identified for the project.

How due account of all and any input received during ongoing communications has been taken:

The community sensitisation meetings were conducted in the prevalent language of the region, namely Sepedi and isiTsonga. General feedback and questions received during the meetings translated in English included¹⁵:

Feedback received	Response
Some community members have asked for a bigger stove or a stove with two plates.	Households tend to use bigger pots for family and/or social gatherings. It is explained to stakeholders that the stove is intended to aid the daily cooking habits and not to replace cooking at large gatherings. The project proponent is constantly on the lookout for the best ICS technology available, including options for 2 plate stoves.
Some community members did not receive stoves	The community members who did not receive stoves are requested to provide their details to the relevant Traditional Authority, who are requested to send the information on to the Implementing Partners, to arrange a day to distribute to these households.

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. The table below lists the community meetings held in this monitoring period.

¹⁵ Community meeting logs are submitted alongside this Monitoring Report. (2505_MRV2_Community Meetings_v1)

Table 1: The consultation meetings and sensitization meetings conducted in the second monitoring period are listed below:

PI1-K2C			
Meeting Date	Village	Meeting Location	Number of Attendees
2022/03/30	Lulekani	Lulekani Town Hall	38
2022/03/30	Majeje_Village	Phulani Byihola Primary School	31
2022/06/29	Selwane	Selwane Tribal Office	32
2022/08/18	Maseke	Banakome Ba Maseke	48
2022/09/08	Mbaula	Mbaula meeting point	74
2022/09/08	Phalaubeni	Bandla meeting point	50
2022/10/14	Humulani	Humulani Drop in center	118
2022/10/14	Matiko_Xikaya	Madanwini Sport Ground	41
2022/02/21	Calais	Calais Community Hall	17
2022/02/23	Finale	Finale sport ground	126
2022/03/02	Kanana	Kanana Community Hall	37
2022/03/02	Hlohlokwe	Hlohlokwe Community Hall	36
2022/03/03	GaMametia	Bakone ba Ga-Mametja	33
2022/03/09	Madeira	Stone sports ground	44
2022/03/10	Enable	Enable Community Hall	18
2022/03/16	Bochabelo	Bochabelo Home Ground	35
2022/03/19	Sedawa	Barcelona soccer field	34
2022/04/20	Metz	Tribal Authority Hall	26
2022/04/20	Metz	Nareng Primary School soccer field	16
2022/05/18	Balloon	Vultures Sports Ground	40
2022/05/31	Moname	Lebogang Day Care Center	41
2022/07/27	Sedawa	Matsikinyane Primary School	46
2022/08/10	Phiring	Dinkwanyane tribal authority	35

2022/08/11	Malaeneng	Pentecost Apostolic Church	32
2022/09/14	Worcester	Butswana community hall	41
2022/09/15	Metz	Makgaung Mak	25
2022/09/16	Kanana	Mahlomelong SASSA Office	67
2022/04/13	Welverdiend	Sticking meeting place	63
2022/05/11	Gottenburg_C	Indunas House	13
2022/07/06	Hlalakahle	Indunas house	22
2022/09/11	Hlavekisa	Hlavekisa Tribal Authority	89
2022/11/04	Lephong_Allendale	Thulamahashe Office or Nursery	20
2022/03/23	GaBoelang	Manawe Stove	29
2022/04/28	Brooklyn	Klasserie sports ground	11
2022/06/23	Matibidi	Mashilane Tribal Authority	16
2022/06/23	Matibidi	Kgautswana Tribal Authority	38
2022/06/24	Arthurs_Seat	Lattter Rain Church International	40
2022/08/03	Moloro	German High School	110
2022/08/03	Leroro_A	Nkotobona Secondary School	42
2022/08/12	GaBoelang	Nkotobona high school Hall	24
2022/08/25	Greenvalley	Maripe High School	45
2022/08/25	Greenvalley	Mmaphutaditshaba high school	65
2022/08/26	Craigisburn	Latter Rain Church International	78
2022/09/01	Wales	Moreipusho Tribal Office	98
2022/09/15	Arthurs_Seat	Ga-Morale	68

PI2-WB

Meeting Date	Village	Meeting Location	Number of Attendees
2022/04/28	Danisani	Danisani	10
2022/08/17	Ga_Chokoe	Ga seema hall site	47
2022/08/26	Mashahleng	SPORTS GROUND	10

2022/09/14	Ga_Mapela	Parakis hall	22
2022/05/30	Lenkwane	Jackalasfreei	40
2022/11/01	Ga-Malapile	School hall.	112
2022/06/29	Jakkalskuil	Tribual office	9
2022/06/29	Basterspad	Ndona yard	14
2022/10/06	Dibeng	Limburg secondary school	40
2022/10/25	Phetole	Hall	54
2022/10/27	Setumong	Under the trees.	38
2022/04/22	Makobe	Ga matlala	35
2022/10/21	Ham_(Ham_Primary_School)	Ham primary school	117

3 IMPLEMENTATION STATUS

3.1 Implementation Status of the Project Activity

Two 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	208,256	292,468
PI2-WB	117,994	150,124
Total	326,250	442,592

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.

One change from the previous monitoring period, is in the creation and deployment of community and project support teams in both 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. As MP1 closed less than 6 months following the project start, and ICS were distributed progressively over that time, most end users had not had the time to properly adopt to the new technology.

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 benefits, engage and survey communities to understand the local practices and promote project participation. The primary focus of this team is post-distribution sensitisation (which includes education and demonstrations), with a secondary focus on household surveys to measure stove adoption and inform the project process.

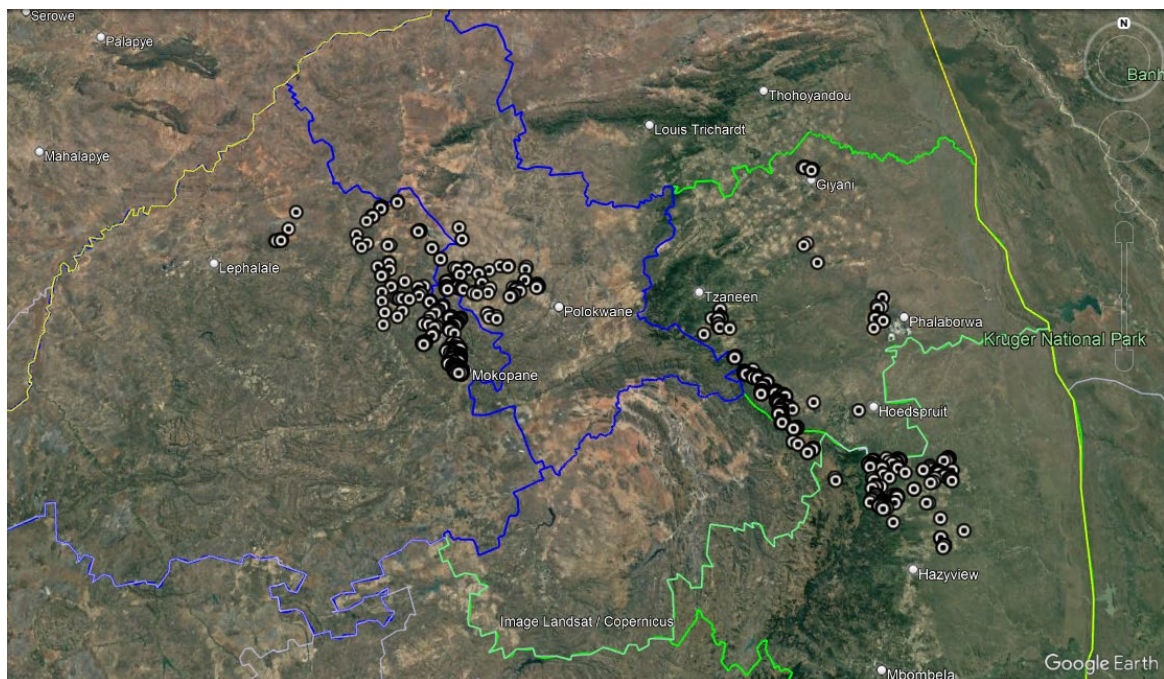
The community and project support teams are tasked with engaging with the project communities post-distribution with the goal of increasing stove uptake and encouraging continuous usage of the project stoves. They are responsible for arranging the appropriate permissions with the Traditional Authorities (TAs), and planning and executing community 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 and KPT 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. Four permanent monitors have been employed in each PI during this monitoring period.

Almost 4,000 stove recipients have been directly engaged with just through community meetings and household surveys in this monitoring period, however it is expected that significantly more end users will have been reached by the various stakeholder engagement platforms.

The locations of household surveys for internal monitoring conducted in PI1-K2C (indicated by the green boundary) and PI2-WB (indicated by the blue boundary) during this monitoring period are shown below:



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.

A continued presence in the landscape has proven to be critical to increasing the acceptance of the stoves in the communities, and providing support to people who don't know how to use the stove or don't yet personally realise the benefits of using the stove.

Through the efforts and engagements of the teams, the rate of stove adoption and use is expected to increase over time and be higher in MP2 when compared to MP1, during which no adoption reinforcement activities had taken place. By applying KPTs as a quantification method, it will be possible to compare the change in biomass usage over time in future monitoring periods.

The monitoring period covered within this report is 10/02/2022 to 31/01/2023.

Key project dates are summarised in the table below:

Monitoring activities

Date	Activity for PI1	Activity for PI2
20/08/2021	Project start date First stove distributed for PI1	
03/09/2021		First stove distributed for PI2
10/02/2022	Start date of MP 2	
27/09/2022 to 16/01/2023	KPT surveys for monitoring period 2	
13/10/2022 to 09/12/2022	Habit surveys for monitoring period 2	
31/01/2023	End date of MP 2	

3.2 Deviations

3.2.1 Methodology Deviations

No methodology deviations were applied during this monitoring period.

3.2.2 Project Description Deviations

3.2.2.1 Previous Project Description Deviations

Other entities involved in the project is not listed 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, 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 two entities involved are:

PI1-K2C:

Organization name	Kruger to Canyons Biosphere Region Non-Profit Company (K2C BR NPC)
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

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

3.3 Grouped Projects

No new project instances were included in this monitoring period.

The distribution of ICS in the existing two PIs (i.e. PI1-K2C¹⁶ and PI2-WB¹⁷) 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
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¹⁶ PI1-K2C was included in the project description document titled: “Fuel Efficient Cooking in South Africa” v5.0, 03-March 2022.

¹⁷ PI2-WB was included in the document titled: “1st Monitoring Report: Fuel efficient cooking in South Africa” v4.0; 14 June 2022.

			in PI1-K2C and PI2-WB 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. ^{18, 19} 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 PI2-WB. b) End users were asked to state their source of energy 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 both PIs within South Africa. b) Both PIs are subject to the same baseline scenario

¹⁸ SeTAR Centre. 2013 Stove Thermal Efficiency and Emissions Interim Test Report- RocketWorks Wood Stove.

¹⁹ BECT. 2015. Stove Thermal Efficiency Test Report- Rocket Works Zama Zama

			described in Section 3.4 of the latest version of the Project Description as identified and demonstrated by baseline surveys. ²⁰²¹
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 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	There is no government mandated programme or policy in South Africa ensuring the distribution of new project activity instances or fuel efficient cookstoves. - Both PIs comply with the positive list in the methodology and satisfies criterion 1 as it meets all the applicability conditions of the methodology. - The End User Agreements confirm that the PIs “install or distributes stoves at zero cost to the end-user and has no other source of revenue other than the sale of GHG credits”²² 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.

²⁰ Kok, L. 2021. Field Baseline Report – Waterberg. Fuel Efficient Cooking in South Africa.

²¹ Kok, L. 2021. Field Baseline Report – Kruger 2 Canyons. Fuel Efficient Cooking in South Africa.

²² An example of the End-User Agreement is submitted alongside this Monitoring Report

		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.	
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. - Such instances shall be divided into clusters, whereby each cluster is comprised of any system of instances such that each instance is within one kilometer of at least one other instance in the cluster. Instances that are not within one kilometer of any other instance shall not be assigned to clusters. - None of the clusters shall exceed the capacity limit and no further project activity instances shall be added to the project that would cause any	The VMR0006 methodology does not contain a capacity limit.	A capacity limit does not apply under the VMR0006 methodology.

	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 criteria for the inclusion of new project activity instances. Partial compliance with multiple sets of eligibility criteria is insufficient.	Compliance of new PIs will be evaluated exclusively against the eligibility criteria listed in this table.	All newly distributed ICS comply with the full set of eligibility 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	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 two existing PIs are included in the PDD and in the first Monitoring Report Section 3.4. Monitoring data for all stoves distributed across the GP is provided to the VVB at verification.

		stakeholder engagements, baseline surveys ²³ and applicable provisions will be included when submitting for PI validation 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
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

²³ 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.

			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 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 Eligibility criteria 1: VM0006 Applicability conditions

No	Applicability Condition	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. All newly distributed ICS are the Rocket Works' "Zama Zama" fuel efficient cookstoves which are designed specifically for domestic premises as described in the manufacturer's technology description and in the PDD. b) Household or community-based kitchen information, including GPS coordinates and the recipient's details was collected at point of distribution which are kept in the 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.	All newly distributed ICS has a thermal efficiency of at least 25%. a) The manufacturer's specification from Rocket Works for the Zama Zama rocketstove indicates a baseline 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: $\eta_{\text{new},i,y} = \eta_p * (DF_n)^{y-1} * 0.94$ $\eta_{\text{new},i,y} = 0.3637$ for stoves distributed in this monitoring period and $\eta_{\text{new},i,y} = 0.3600$ for stoves older than one year. 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. All stoves operational in the GP during this monitoring period adhere to this condition.
3	Both 'Projects' and 'Large Projects' can use the methodology	The project size is allowed for the GP and PIs. The GP is defined as a "Large Project" according to the guidelines set out in the VMR0006 methodology and can therefore apply the methodology. The total ERs estimated from PI1-K2C over the crediting period is 5,275,433 tCO2e and therefore defined as a "Large Project" according to the guidelines set out in the VMR0006 methodology. The PI therefore complies with the GP requirements.

4	Non-renewable biomass has been used in the project region since 31 December 1989, using survey methods or referring to published literature, official reports or statistics; and	Non-renewable biomass has been used in both PIs since 31 December 1989. Evidence was provided at validation of both 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 is 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)	All ICS distributed in the Grouped Project have: – Unique ICS ID (serial number) – Recorded GPS location (where possible) – End user data (name/address/physical location/phone number/govt. ID number - where possible) – Records of baseline stove type and fuel type used. This data uniquely identifies each ICS, avoiding any double counting. It enables the PI Implementer to trace each user for future monitoring and verification. Duplicate or incorrect End User data is identified automatically in the GPs data processing system and corrected by the PI Implementer.

		All distribution data is held securely in the monitoring database.
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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 survey conducted by TASC for PI2-WB ^{24 25}
Value applied	5.49 for PI1-K2C 5.00 for PI2-WB
Justification of choice of data or description of measurement methods and procedures applied	This parameter shall be determined at the Project Instance level. A field baseline survey was conducted by TASC in May 2021. The protocols followed are described in Section 3.3 above and in the Field Baseline Report submitted alongside this document.
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

²⁴ Kok, L. 2021. Field Baseline Report – Waterberg. Fuel Efficient Cooking in South Africa. TASC.

²⁵ Kok, L. 2021. Field Baseline Report – Kruger 2 Canyons. Fuel Efficient Cooking in South Africa. TASC

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 PI2-WB. See associated report: Biomass Baseline for Cookstove Project in the Kruger to Canyon and Waterberg Biospheres; and fNRB calculation sheet: “2021-03-26 Values for baseline and fNRB calculation v1” ^{26,27}
Value applied	0.89 for PI1-K2C 0.99 for PI2-WB
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 for PI2-WB ²⁸ .
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: ²⁹ 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	

²⁶ 2021-03-31 Values for baseline and fNRB calculation v1_Promethium_Field baseline values

²⁷ Promethium Carbon. 2021-03-31. Desktop Study: Biomass Baseline for Cookstove Project in the Kruger to Canyon and Waterberg Biospheres.

²⁸ TOOL30: Calculation of the fraction of non-renewable biomass. Available online at: <https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-30-v3.0.pdf>

²⁹ Available at: <https://verra.org/methodology/vmr0006-methodology-for-installation-of-high-efficiency-firewood-cookstoves/>

Data / Parameter	$EF_{WF,non-CO_2}$
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: ³⁰ 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.
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 ³¹
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. Value applied is for PI2-WB.
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

³⁰ Available at: <https://verra.org/methodology/vmr0006-methodology-for-installation-of-high-efficiency-firewood-cookstoves/>

³¹ SeTAR Centre. 2013. Stove Thermal Efficiency and Emissions Interim Test Report – RocketWorks Wood Stove.

Description	Number of project devices of type i and batch j operating during year y
Source of data	Monitoring survey
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. 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	362,925
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	The proportion of operational stoves (82%) obtained from the habit survey is multiplied by the total distributed stoves (442,592) to arrive at this value.

Data / Parameter	$\eta_{\text{new}, i, j}$
Data unit	Fraction
Description	Efficiency of the device of each type i 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: - 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. - Efficiency to be tested is high-power thermal efficiency. The high-power thermal efficiency is the average of the Cold Start and Hot Start phases³². - The average of all results for each device type/model and batch shall be taken as the efficiency for each device type and batch. - 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. - 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.
Frequency of monitoring/recording	Annually
Value monitored	0.3637 for stoves distributed in this monitoring period 0.3600 for stoves older than one year
Monitoring equipment	N/A
QA/QC procedures to be applied	N/A
Purpose of the data	To determine compliance with VMR0006 applicability condition 2 and to calculate $B_{y,savings,i,j}$ in Equation 3.
Calculation method	Equation 5
Comments	
Data / Parameter	$B_{y=1,new,i,j,survey}$
Data unit	Tonnes

³² 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.

Data / Parameter	μy
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.³³ Stove usage frequency of “Everyday” considers usage as 7 days a week, “Several times a week” as 5 or 6 days a week, “Once a week” as 4 or less but more than 1 day a week, “Less than weekly” as less than once a week, and “Never” as 0 days a week. A proportion is assigned to the usage frequency

³³ 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.

	accordingly as “Everyday” = 1, “Several times a week” = 0.71, “Once a week” = 0.14, “Less than weekly” = 0.07, and “Never” = 0. The baseline stove usage is therefore calculated as 1 minus the stove use proportion.
Frequency of monitoring/recording	At least one every two years
Value monitored	0.417
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 emissions 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 6
Calculation method	As per the methodology: For projects that opt for $B_{y=1,new,i,j,survey}$ i.e., direct measurement of biomass used in project stoves (for example via KPT), then μy is not required to be computed.
Comments	

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.

	d) 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
Monitoring equipment	-
QA/QC procedures to be applied	The baseline surveys for PI1-K2C and PI2-WB shows predominant use of wood fuel amongst households in the first two 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 ³⁴
Frequency of monitoring/recording	Once at point of distribution
Value applied	5

³⁴ Rocket Works Stove Longevity. 2021.

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 Ny,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
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. As per the Grouped Project Description (Section 5.3, page 61): 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, PI are categorized as CDM small scale, 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 PIs³⁵. 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 and surveys to determine parameter $N_{y,i,j}$ and μ_y were conducted covering both PIs 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 442,592 households that received an ICS.

c. Sampling Method

³⁵ That is, the populations of all Project Instances in the group are combined together, the sample size is determined and a single survey is undertaken to collect data.

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.

d. Sample Size

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

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

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)

ii. 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

As per the Verra-approved Sampling Plan described in the Project Description (Section 5.3, page 61), the PP has used the UNFCCC's recognized Standard: "Sampling and surveys for CDM project activities and programmes of activities, v4", to obtain '*statistically*

valid results’ via its associated sample size calculator: “CDM Survey Sample Calculator v03.1”

Using the CDM Survey Sample Calculator v03.1³⁶, the sample size for $N_{y,i,j}$ was determined for a proportion parameter:

Expected proportion, p	0.812
Confidence level	95%
Z multiplier	1.960
Relative precision	10%
Population size, N	442,592
Predicted sample size, n	89

The expected proportion was informed by the previous monitoring and verification process for this GP, which was concluded in June 2022.

The PP has shown in the sample size calculation how this obtains “*statistically valid results*” and is calculated to a 95/10 level of precision, as demonstrated in the Sample Size calculations.

For μ_y , the sample size was determined according to Section 8.4 Option (b) of the VMR0006 v1.1 methodology, i.e. Project target population > 1000: Minimum sample size 100. The larger sample size of the two parameters was selected to survey both the $N_{y,i,j}$ and μ_y parameters in one survey. VMR0006 v1.1 Section 8.4 option (b) also states: “*This simplified approach may also be used for determining minimum sample size for parameters listed under Sections 9.1 and 9.2 in which case it is not requisite for the sample size to meet confidence/precision requirements*”

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. A group of two PIs were included in the sampling.

4.3.2 Data Recording

Field-based monitoring activities to determine monitored parameter values were conducted through a field survey.

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

³⁶ Available at: <https://cdm.unfccc.int/Reference/Guidclarif/index.html>

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 comprised 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 respondents that meets the required level of precision. 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.

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 both PIs between September 2022 and January 2023. The alternative minimum sample size of 100 households as per VMR0006 were selected to survey for the proportion parameters $N_{y,i,j}$ and μ_y .

Each stove in the distribution database was assigned a random number using the Excel RAND() function. The database subsequently sorted the unique stove entries based on the random number assigned in ascending order. The first 100 random numbers were selected as samples for the Habit surveys. The survey database, which includes the GPS coordinates of each survey is submitted with this monitoring report.

Habit Survey Summary

Analysis of survey questions for parameter $N_{y,i,j}$, indicated a proportion of 0.82 of disseminated stoves are being used. To determine this proportion, stove recipients were asked how often they use the stove. The answers “Everyday”, “Several times a week”,

“Once a week” and “Less than once a week” were considered indicative of stove usage. The answer “Never” was considered a non-user. 82 out of the 100 users surveyed reported that they use the stoves.³⁷ This proportion is therefore applied to the gross number of distributed stoves to exclude the 18% of stoves that are considered as not in use (i.e. responded as ‘never’). With an ongoing stove adoption and monitoring programme being undertaken by the PI Implementers, the proportion of stoves in use may increase in subsequent monitoring periods.

The survey results meet the precision requirements at 9.2% according to the CDM Survey Sample Calculator v03.1 and shown below.

Actual sample size	100
Sample proportion	0.8200
Standard error of the proportion	0.0384
Precision associated with a proportion	0.0753
Relative precision	9.2%

During the verification, the VVB interviewed one ICS end user who claimed that they had not used wood fuel in the baseline scenario. This contradicted the information provided by the same end user at the distribution stage, where the distribution team identified that the household was using wood fuel on an open fire and the end user confirmed this in the distribution survey. The end user had moved house in the intervening time, which may have led to some confusion around the questioning. The PP will remove the end user from the monitoring database for future monitoring periods.

Furthermore, to account for the discrepant record where there are ‘*greater than c discrepant records*’ (i.e. $c=1$ and not $c=0$), the PP has chosen the following option as per paragraph 38(b) of the Standard: Sampling and surveys for CDM project activities and programmes of activities; Version 09.0, and has provided a ‘*revised estimation of emission reduction*’. This is undertaken by removing the discrepant end user from the final tally of stoves that are considered ‘in use’ for the monitoring period. As this user was 1 amongst 11 samples assessed by the VVB during verification, this will reflect as a 9.1% decrease in the reported number of stove usage days across the entire population and serve as a discounted revision to the emissions reductions claimed accordingly.

Analysis of survey questions to determine the continued use of baseline cookstoves in addition to project stoves indicated a proportion of 0.417 of baseline stove usage (μ_y)

³⁷ See also 2505_MRV2_Habit Surveys_v1.xlsx

across the GP. This was determined by surveying the frequency of baseline stove usage on a proportionate scale according to the survey answer, where “*Never*” is 0 and “*Everyday*” is 1. In this way, the average proportion of continued baseline stove usage across the GP was determined. As the VMR0006 v1.1 simplified minimum sample size option (b) applied, (i.e., project target population > 1,000: minimum sample size of 100) it is not requisite for the sample size to meet the confidence/precision requirements.

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 is comprised of local operatives who are conversant in the 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 Habit Survey questionnaire was based on the qualitative survey of the Kitchen Performance Test (KPT) Protocol v4 of the Clean Cooking Alliance³⁸, the principal field-based procedure to measure household fuel consumption, which is used to contextualise fuel consumption practices and report on the SDG contributions.

The survey was performed in the austral summer between September 2022 and January 2023. Monitors visited each household to explain the purpose of the survey and to request the household members’ consent to conduct the survey.

The Habit survey data was gathered by the monitors via a mobile survey platform (SurveyCTO) specifically designed for the project. The data was collated into the Excel workbook titled “2505_MRV2_Habit Surveys_v2”, submitted alongside this report.

5 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

³⁸ Bailis, R., Thompson, R., Lam, N., Berrueta, V., Muhwezi, G. & Adams, E. 2018. Kitchen Performance Test (KPT) v4.0. Clean Cooking Alliance. 16p.

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

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

5.4 Net GHG Emission Reductions and 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 CO ₂ e
$ER_{y,i,j}$	=	Emission reductions by improved cook stove of type i and batch j during year y in t CO ₂ e

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

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.

1. 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 Habit Survey.
2. The assumed reduction in stove efficiency with age was calculated for stoves younger than 1 year, and between 1 and 2 years old using Equation 5. $B_{y,savings,i,j}$ was subsequently calculated with Equation 4 for each PI and stove age category.
3. 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. This value was then multiplied by the number of days each stove has been operational since the start of the monitoring period to determine the $ER_{y,i,j}$ for each individual stove. The sum of the individual stove $ER_{y,i,j}$ values was then calculated with Equation 1 to determine ER_y .
4. Finally, the stove usage rate ($N_{y,i,j}$) determined with the Habit Survey, and a 0.909 representative proportion discount for the one ICS end user who claimed they not used

wood fuel in the baseline scenario (see also Section 4.3.5) was applied to the total ER_y .

To calculate the annual quantity of ERs, the fixed parameters and example calculations for both PIs are outlined below.

Parameter	Unit	Value for PI1-K2C	Value for PI2-WB	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		Efficiency of the baseline cookstove being replaced.	VMR0006 default
B_{old}	tonnes/year	5.49	5.00	Quantity of biomass consumed in baseline.	Field baseline KPT surveys for PI1-K2C and PI2-WB.
$F_{NRB,y}$	fraction	0.89	0.99	Fraction of biomass used in baseline scenario, which can be established as non-renewable.	fNRB studies for PI1-K2C and PI2-WB.
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
μ_y	fraction	0.417		Baseline stove usage factor to account for use of baseline cookstoves along with improved cookstoves	Habit survey

$n_{y,i,j}$	fraction	0.82		Proportion of operational stoves in this monitoring period.	Habit survey
For stoves less than 1 year old					
$\eta_{new,y}$	fraction	0.3637		Efficiency of improved cookstove in year y	Equation 5
$B_{old,adjusted}$	Tonnes/year	3.2000	2.9144	Adjusted B_{old} to account the ex-post usage of firewood in baseline cookstoves	Equation 6
$B_{y,savings}$	tonnes/year	2.3201	2.1130	The quantity of woody biomass saved in the project scenario.	Equation 4
$ER_{y,i}$	tCO2e/year	4.2158	4.2854	ERs generated per stove per year	Equation 2
$ER_{day,i}$	tCO2e/day	0.0115	0.0117	ERs generated per stove per day	$=ER_{y,i}/365$
Stove days	days	42,595,970	25,202,183	Total number of operational stove days	Distribution database
ER_y (before usage discount)	tCO2e	491,991.60	297,311.40	Emission reductions during year y	Equation 1
ER_y (after usage discount)	tCO2e	366,720.70	221,609.97	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)	tCO2e/year	3.1424	3.2095	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 1 and less than 2 years old					
$\eta_{new,y}$	fraction	0.3600		Efficiency of improved cookstove in year y	Equation 5
$B_{old,adjusted}$	Tonnes/year	3.2000	2.9144	Adjusted B_{old} to account the ex-post usage of firewood in baseline cookstoves	Equation 6
$B_{y,savings}$	tonnes/year	2.3112	2.1049	The quantity of woody biomass saved in the project scenario.	Equation 4
$ER_{y,i}$	tCO2e/year	4.1996	4.2690	ERs generated per stove per year	Equation 2

ER_{day,i}	tCO ₂ e/day	0.0115	0.0116	ERs generated per stove per day	=ER _{y,i} /365
Stove days	days	28,087,245	10,326,595	Total number of operational stove days	Distribution database
ER_y (before usage discount)	tCO ₂ e	323,170.18	199,366.50	Emission reductions during year y	Equation 1
ER_y (after usage discount)	tCO ₂ e	240,884.59	88,973.40	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	3.1303	3.1448	Emission reductions per stove per year after baseline stove usage discounts were applied	= [ER _y (after discounts)/Stove days]*365
Total verifiable ERs	tCO ₂ e	607,604	310,583	Total ERs generated for the operational stoves during the monitoring period.	=ΣER _y (Equation 1)

A summary of the net GHG emission reductions and removals for the second monitoring period is tabulated below:

A summary of the net GHG ERs for the GP:

Vintage	Baseline emissions or removals (tCO ₂ e)	Project emissions or removals (tCO ₂ e)	Leakage emissions (tCO ₂ e)	Net GHG emission reductions or removals (tCO ₂ e)
10-February-2022 to 31-December-2022	801,138			801,138
01-January-2023 to 31-January-2023	117,049			117,049
Total	918,187			918,187

Comparison of the MP1 and MP2 monitored ERs:

	MP1	MP2	Change	Justification for the difference
PI1 ERs	77,797	607,604	681%	208,256 additional stoves were distributed during MP2, leading to the increase in associated ERs
PI2 ERs	26,050	310,583	1,092%	117,994 additional stoves were distributed during MP2, leading to the increase in associated ERs
Average per-ICS ERs	3.883	3.157	-18.7%	The PP expected to see an increase in per-ICS ERs for this MP, but this actually decreased for the following reasons: 1. Relying solely on survey data and a default ICS efficiency in MP1 and MP2 creates some uncertainty in understanding the actual use of wood fuel on a day-to-day basis in project households. Fuel use savings and associated baseline stove usage are not measured in the household, but ascertained via a survey. This approach has led to a high level of actual ICS usage being discounted proportionally. 2. Following the identification of a single discrepant record in the monitoring sample by the VVB, a 9.1% discount was applied to stove operating days for households where the baseline stove was not an open-fire. Therefore, a large proportion of the distribution database is excluded from the ER accounting.

Comparison of the ex-ante calculated and monitored ERs for MP2:

Ex-ante emission reductions	Achieved emission reductions	Difference	Justification for the difference
2,095,476	918,187	-56.18%	Although more stoves were distributed in the project scenario than in the ex-ante calculations (442,592 vs. 382,000) the different discounts applied resulted in the lower achieved emission reductions.

			1. the baseline quantity woody biomass was reduced by 34% to account for continued baseline stove usage alongside the ICS in the project scenario. 2. an 18% reduction was further applied to the ERs to account for project stoves that are not in use. 3. another 9.1% discount was applied to the ERs to account for the proportion of households that were found to have a baseline stove discrepancy.
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