



1ST MONITORING REPORT: FUEL EFFICIENT COOKING IN SOUTH AFRICA



Document Prepared by TASC SA (PTY) LTD

Project Title	Fuel Efficient Cooking in South Africa
Version	4.0
Report ID	Fuel Efficient Cooking in South Africa: 1 st Monitoring Report
Date of Issue	14-June-2022
Project ID	2505
Monitoring Period	20-August-2021 to 09-February-2022
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1 PROJECT DETAILS

1.2 Summary Description of the Implementation Status of the Project

This is the first monitoring report for the Fuel Efficient Cooking in South Africa 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 20 August 2021 to 09 February 2022.

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, 114,716 Rocket Works Zama Zama rocket stoves were distributed in this monitoring period.

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

GHG emission reductions in this monitoring period:

Total: 103,847 tCO₂e

Total in PI1-K2C2: 77,797 tCO₂e

Total in PI2-WB3: 26,050 tCO₂e

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

² Project Instance 1 – Kruger 2 Canyons

³ Project Instance 2 - Waterberg

1.3 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.

1.4 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

1.5 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
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

1.6 Project Start Date

The Grouped Project start date is 20 August 2021, as described in Section 1.8 of the PDD. The Project Instance start dates are given below:

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

1.7 Project Crediting Period

The crediting period for the Project Instances is fixed for 10 years. The crediting period start dates are the same as the Project Instance start dates outlined above.

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

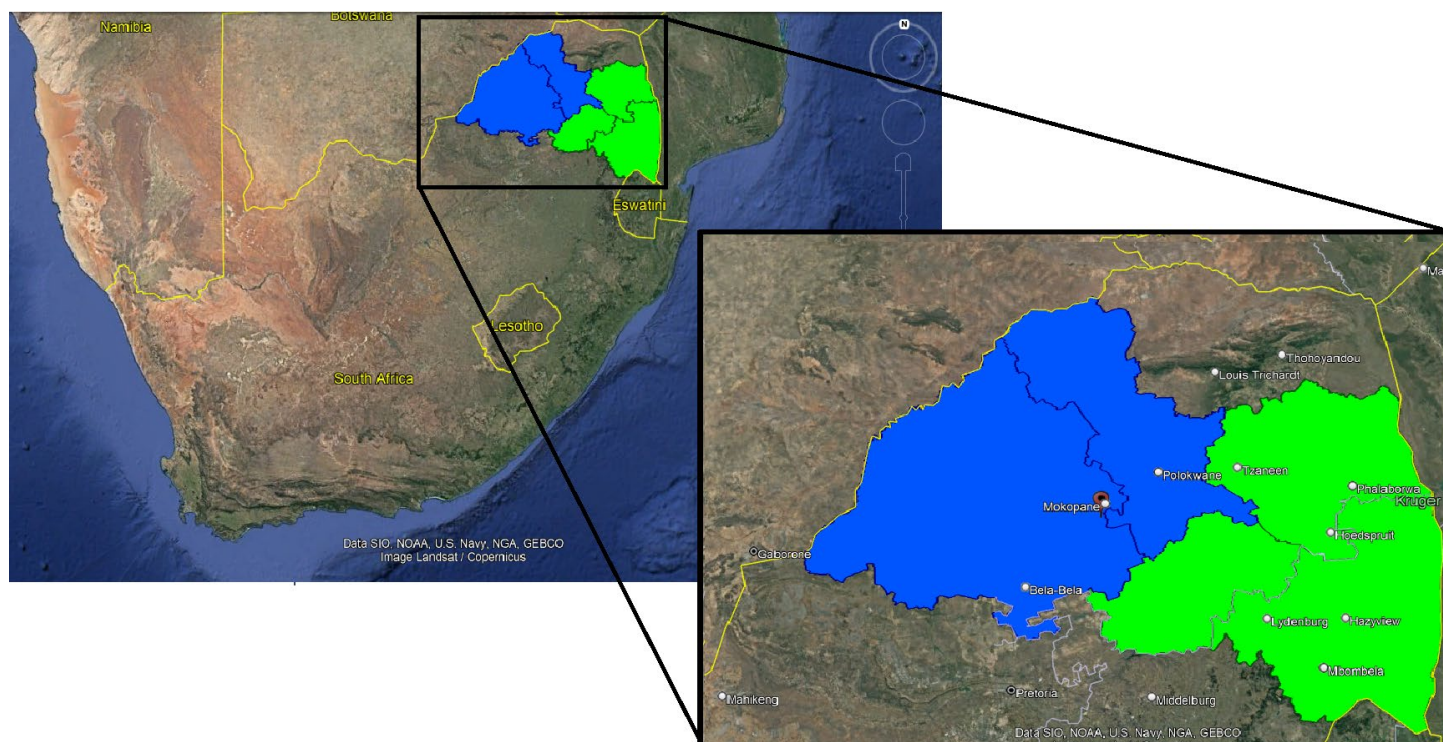


Figure 1. The Grouped Project is located within the Republic of South Africa. The two project instances, P11-K2C (green) and P12-WB (blue), spanning the Limpopo and Mpumalanga Provinces, are indicated in the insert. ⁴

1.9 Title and Reference of Methodology

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

- *VMR0006 Methodology for Installation of High Efficiency Firewood Cookstoves v1.1.*⁵

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*⁶
- *CDM TOOL19: Demonstration of additionality of microscale project activities, v9*⁷

⁴ US Dept of State Geographer. Image Landsat/Copernicus. 2020 AfriGIS (Pty) Ltd. Data SIO, NOAA, U.S. Navy, NGA, GEBCO.

⁵ Available at: <https://verra.org/methodology/vmr0006-methodology-for-installation-of-high-efficiency-firewood-cookstoves/>

⁶ 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

⁷ Available at: <https://cdm.unfccc.int/methodologies/PAMethodologies/tools/am-tool-19-v9.pdf>

- *CDM TOOL30: Calculation of the fraction of non-renewable biomass v3⁸*

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

1.10 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.

1.11 Other Forms of Credit

Emissions Trading Programs and Other Binding Limits:

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

1.12 Sustainable Development

From the Priorities listed in the Sustainable Development Goals Country Report 2019 – South Africa⁹, this project will contribute to the SDG priorities in the following ways:¹⁰

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.

⁸ Available at: <https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-30-v3.0.pdf>

⁹ http://www.statssa.gov.za/MDG/SDGs_Country_Report_2019_South_Africa.pdf

¹⁰ The surveys for this monitoring period were completed before publication of the new Monitoring Report Template v4.1. The project will include SDG contribution quantification in future monitoring periods, in accordance with the VCS Standard v4.2. in Appendix 2 point v4.2.4

- 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.
- 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.

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. The process followed for both instances monitored in this report is summarized below:

Procedures or methods used for engaging local stakeholders:

Stakeholder consultations were conducted prior to the project instance implementation. Stakeholders in the different stakeholder categories were identified with the help of the implementation plan and invited to attend a physical or online meeting. The stakeholder categories included: a) Local people, communities and/or representatives directly or indirectly impacted by the project; b) Stakeholders with land-tenure rights within or adjacent to the project; c) Local policy makers and representatives of local authorities; d) DNA representatives of host country; e) Local NGOs and women's groups working on topics relevant to the project. The meetings provided information and background on TASC, the technology, the distribution plan and implementation partners, and the grievance mechanism. Meetings were facilitated in, and the non-technical summary was provided in the relevant local languages. The local authorities and community members are consulted

in sensitisation meetings demonstrating the project, the use and maintenance of the stoves are carried out before distribution starts in a village.

Table 1: The consultation meetings and sensitization meetings to date are summarized below:

	PI1-K2C	PI2-WB
Local stakeholder consultations:	1. Online meeting 22/01/2021 2. Webinar 22/04/2021 3. Sedawa Municipal Hall 11/05/2021 4. Lulekani Municipal Hall 12/05/2021 5. Brooklyn Nazarene Church 13/05/2021 6. Mnisi Tribal Hall 14/05/2021	1. Webinar 23/07/2021 2. Bakenberg Tribal Hall 20/07/2021
Sensitisation Engagements	1. Thorndale 21/09/2021 2. Gottenburg C 9/09/2021 3. Hluvukani (Clare A) 28/09/2021 4. Mošate Tribal Office 7/09/2021 5. Balloon 29/08/2021 6. Kanana 13/08/2021 7. Malaeneng & Phiring 10/09/2021 8. Phalaubeni 18/08/2021	1. Ga-Chokoe 01/11/2021 2. Malokong 01/11/2021 3. Kwakwalata 01/11/2021 4. Mapela Ga-Mabusela 03/11/2021 5. Ga Chaba 03/11/2021 6. Parakys 03/11/2021 7. Mosoge 04/11/2021 8. Magope Royal Kraal 04/11/2021

9. Mbaula 18/08/2021	9. Mahlogo 04/11/2021
10. Selwane Tribal Authority 18/08/2021	10. Ga Mabuela 05/11/2021
11. Phulanibiyihola primary school 13/08/2021	11. Rooivaal 05/11/2021
12. Ninakhulu Primary school 13/08/2021	12. Fothane 05/11/2021
13. Moletete Tribal Authority 17/08/2021	13. Magope Royal Kraal 07/11/2021
14. Lafata Drop in Center 4/10/2021	14. Mahabaneng 07/11/2021
15. Mohlala Tribal office 13/08/2021	15. Rasello 21/11/2021
16. Mashilane and Mohlala Tribal Authorities 13/08/2021	
17. Tours 10/08/2021	
18. Mashishimale tribal authority (Moshate) 6/08/2021	
19. Butswana 07/12/2021	

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

The online webinars were recorded and consultation meeting reports were compiled with attendance records included. On both the online and physical meeting platforms, the stakeholder questions and comments were recorded. After the consultation meetings, stakeholders were invited to fill out a feedback form, which is stored in the company's archives and summarized in the consultation reports. Overall, the reception of the project has been positive.

Mechanism for ongoing communication with local stakeholders:

Sensitisation meetings that aim to demonstrate the ICS usage and maintenance, as well as introduce the social-, economic- and environmental benefits of using the ICS, 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 physical stakeholder consultation and community sensitization meetings were conducted in the prevalent language of the region, namely Sepedi. General feedback and questions received during the meetings translated in English are presented below:

Question	Answer
When will the stoves come	We hope to start in September, that will depend on the paperwork that still needs to be done before distribution can start.
Will they be given to every household or only the counsels of respective villages?	A: Every household that uses wood. One stove per household.
Will the Ndunas be asked to select households that will be getting stoves?	No, the distributors will go to every household that uses wood.
Where will we get twigs for the stove?	You will have to get twigs much or less the same way when you collect wood. The difference with the stove is that you will not collect as much wood as you used to collect.
Life span of the stove.	It is designed to last for 5-7 years
Are there any employment opportunities for villages?	Unfortunately, MT and TASC cannot employ everybody in the villages. The distributors do not come from far. They come from the villages around Mogalakwena. We have already created employment opportunities for 20 data capturers that earned one week's salary during the baseline survey. If there are any other project that come up, the first preference will be people from the communities.
How about the three-legged potjies?	The stove before you is a first prototype. Another prototype was developed with

	holes that can fit three-legged potjies and the pot will be stable.
Is it washable?	Yes
Can the stoves come sooner than the September?	That will depend on the paperwork that still needs to be done before distribution can start. If we finish earlier than expected, we will engage with TASC to start distribution.
Can you distribute more than one cookstove per household?	Unfortunately, we cannot distribute more than one stove per household. We emphasize how fast the stove is to cook with, making it possible to cook complete meals in the same time as on an open fire even if one cooks one dish after the other. The community can also benefit socially by gathering neighbors or families together to cook on multiple stoves.
What about our big gatherings when we use big pots?	The stove cannot fit the big pots on special occasions, but it should be good for use on a daily basis.

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 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.

3 IMPLEMENTATION STATUS

3.2 Implementation Status of the Project Activity

Two PIs have been implemented under the Grouped Project during the monitoring period. The number of ICS distributed in each instance during the monitoring period are:

Project Instance	Number of ICS distributed
PI1-K2C	83,801
PI2-WB	30,915
Total	114,716

Operation of the Project Activities during the monitoring period

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

3.3 Deviations

3.3.1 Methodology Deviations

No methodology deviations were applied during this monitoring period.

3.3.2 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

3.4 Grouped Projects

Two PIs were implemented during the monitoring period namely, PI1-K2C and PI2-WB. In both 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 Project Instances

The eligibility of the first PI (PI1-K2C) was demonstrated at the group project validation and is described in the latest version of the PDD.

The adherence of the new PI (PI2-WB) to the eligibility criteria set out in section 3.5.15 and 3.5.16 of the VCS Standard and section 4 of the VMR0006 methodology and described in Table 1 in the registered PDD is demonstrated in below.

Table 2. Set of eligibility criteria for new project activity instances

No	Eligibility Criterion	Required condition of Project Instances	Evidence provided and applicability to PI2-WB
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.	PI2-WB is compliant with the applicability conditions set out in the applied VMR0006 methodology as demonstrated in Section 3.3.1 in this monitoring report. Please see details below
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. ^{11, 12} The Rocket Works Zama Zama rocket stove, to be distributed in PI2-WB, 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	a) The manufacturer's technology description describes the applicability of

¹¹ SeTAR Centre. 2013 Stove Thermal Efficiency and Emissions Interim Test Report- RocketWorks Wood Stove.

¹² BECT. 2015. Stove Thermal Efficiency Test Report- Rocket Works Zama Zama

		biomass burned in the baseline scenario.	the ICS technology to be distributed in PI2-WB. b) End users will be asked to state their source of energy and baseline appliance at the point of distribution and during the project monitoring. c) This information will be 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 will demonstrate the location of the PI within South Africa. b) PI2-WB is subject to the same baseline scenario described in Section 3.4 of the latest version of the Project Description as identified and demonstrated by a baseline survey, outlined in Section 3.4.4 below.¹³
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. PI2-WB complies 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 Agreement will confirm that the PI “installs or distributes stoves at zero cost to the end-user and has no

¹³ Kok, L. 2021. Field Baseline Report – Waterberg. 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.	other source of revenue other than the sale of GHG credits”¹⁴ 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 PI2-WB 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	The VMR0006 methodology does not contain a capacity limit.	A capacity limit does not apply under the VMR0006 methodology.

¹⁴ An example of the End-User Agreement is submitted alongside this Monitoring Report

	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 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 PI2-WB is demonstrated to be within South Africa (Figure 1). and described in Section 3.3.3 below. b) The GPS/location data captured from each end user demonstrating the location of the PI will be provided at the time of verification. The GPS/location information will be 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	Compliance of new PIs will be evaluated exclusively against the eligibility criteria listed in this table.	PI2-WB complies with the full set of eligibility criteria for the inclusion of new project activity instances as described in this table and Table 2 of the PDD.

	sets of eligibility criteria is insufficient.		
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 surveys¹⁵ and applicable provisions will be included when submitting for PI validation at verification.	The evidences relevant to PI2-WB for the local stakeholder engagements, baseline surveys and applicable provisions is submitted alongside this Monitoring Report, and summarized below in Section 3.3.4. Monitoring data for PI2-WB will be 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.	PI2-WB conforms to the eligibility criteria set out in this table, and will be validated at the time of verification.
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	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. In addition, for PI2-WB,

¹⁵ 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.

	reducing or removing GHG emissions).		Similar to PI1-K2C, the End User Agreement contains the unique serial number that is embossed onto each ICS and will be 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" PI2-WB is a unique project instance in the project boundary which is demonstrated in the unique serial numbers that will be tracked 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	The start date of PI2-WB, evidenced as the sale of the first device in the database will be later than the start date of the GP as per section 1.8 of the latest version of the PDD.

		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 start date of PI2-WB is 03 September 2021 and shown in Section 3.3.5 below.
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.	PI2-WB is eligible for crediting from the start date of the instance until the end of the project crediting period on 19 August 2031.

3.4.1 Evidences of Compliance to Eligibility criterion 1- PI2-WB

Table 3: Applicability of Methodology- VMR0006

No	Methodology Applicability Criterion	How PI2-WB Complies
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.¹⁶ PI2-WB comprises the distribution of the Rocket Works' "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.

¹⁶ SeTAR Centre. 2013 Stove Thermal Efficiency and Emissions Interim Test Report - RocketWorks Wood Stove.

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.	PI2-WB: a) The ICS distributed in this project has a thermal efficiency of at least 25%. The manufacturer's specification from Rocket Works for the Zama Zama rocketstove indicates a thermal efficiency of 38.3%. 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 PI2-WB over the crediting period is 4,707,860 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 and methodology 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 South Africa, the geographic boundary of the GP and the PI2-WB region since 31 December 1989 as demonstrated immediately below this table.
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. PI2-WB is a unique project in the Waterberg region in the Limpopo Province. A list of projects within or close to the PI boundary is submitted to the VVB with this report.
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Non-renewable biomass has been used in South Africa, the geographic boundary of the GP and the PI2-WB region since 31 December 1989. Williams (1986) reported that fuelwood is the sole source of energy for less-developed rural and peri-urban areas in South Africa¹⁷. Wood fuel use in sub-Saharan Africa has increased from 1,500 million m³ to 3,500 million m³ from 1950 to 1990 (Durning, 1991, cited in Dovie et al. 2004)¹⁸. Since 1992, between 80 and 99% of rural households in South Africa have relied on fuelwood to meet their energy needs. In 2012, 67% of households in South Africa still relied exclusively on fuelwood for their energy needs.¹⁹ In sub-Saharan Africa, fuelwood use has steadily increased with population growth (ESMAP, 2020)²⁰. According to the Global Alliance for Clean Cookstoves (2011), 602,000 households are dependent on woodfuel²¹. Therefore, it can be concluded that non-renewable biomass have been used in the project region since December 1989.

¹⁷ Williams, A.T., 1986. The potential for the production of energy from biomass in South Africa (Master's dissertation, University of Cape Town).

¹⁸ Dovie, D.B.K., Witkowski, E.T.F. & Shackleton, C.M. 2004. The fuelwood crisis in southern Africa – relating fuelwood use to livelihoods in a rural village. *GeoJournal* 60, 123-133. doi: 10.1023/B:GEJO.0000033597.34013.9f

¹⁹ Wessels, K.J., Colgan, M.S., Erasmus, B.F.N., Asner, G.P., Twine, W.C., Mathieu, R., Van Aardt, J.A.N., Fisher, J.T. & Smit, I.P.J. 2013. Unsustainable fuelwood extraction from South African savannas. *Environmental Research Letters*. 8 014007.) doi:10.1088/1748-9326/8/1/014007

²⁰ Energy Sector Management Assistance Program (ESMAP). 2020. The State of Access to Modern Energy Cooking Services. Washington, DC: World Bank. License: Creative Commons Attribution CC BY 3.0 IGO

²¹ Global Alliance for Clean Cookstoves. (2011). South Africa Market Assessment – Sector Mapping. Available online at: <https://cleancooking.org/binary-data/RESOURCE/file/000/000/172-1.pdf> e

3.4.2 Evidences of Compliance to Eligibility criterion 2- PI2-WB

As described for PI1-K2C in the PDD, the Rocket Works Zama Zama rocket stove manufactured in KwaZulu-Natal, South Africa, with a thermal efficiency of 38.30%²² is distributed in both PIs. The stoves have a 1-year warranty and an expected average lifetime of 5 years, although this can vary from stove to stove. Project stoves may continue to be credited with emissions reductions beyond 5 years, if they are monitored and proven to still be functioning/in use.

The Zama Zama rocket stove (Figure 2) is made mainly from stainless-steel and is lightweight, portable and designed to fit flat-, round- and 3-legged pots. The interior of the stove is made of heat resistant 0.5 mm stainless steel. The outer material (heat shield) is chromed steel sheet. The pot rest and the stove bottom is made of 1.0 mm galvanized mild steel sheet. The fire tube is protected by a 2.5 mm galvanized wiring cage. The stove can boil 5 litres of water in 15 minutes using as little as 250 g of small pieces of wood. The stove is encased with an insulated grid that allows for handling the stove without causing burns. The bottom of the stove includes a grid that allows for ash to fall through to an ash collection chamber.



Figure 2. The Zama Zama rocketstove manufactured by Rocket Works

3.4.3 Evidences of Compliance to Eligibility criterion 7- PI2-WB

The PI2-WB is within the GP boundary defined as the geographic borders of South Africa (Figure 1). The PI is defined as being:

1. Within the hot- and temperate- interior climatic regions
2. Within the Limpopo Province of South Africa
3. Within the boundaries of the District Municipalities of Waterberg and Capricorn.

²² SeTAR Centre. 2013. Stove Thermal Efficiency and Emissions Interim Test Report – RocketWorks Wood Stove.

Operational management is based in Mokopane, with coordinates:

Latitude: 24°10'35.85"S

Longitude: 29°00'06.35"E

3.4.4 Evidences of Compliance to Eligibility criterion 8- PI2-WB

PI2-WB: Baseline Scenario

The baseline scenario in the PI has been identified as the continued use of non-renewable biomass in the absence of the project activity. A desktop²³ and field baseline²⁴ wood fuel use survey, as well as a fraction of non-renewable biomass survey was carried out in the PI area. The desktop baseline survey concluded that although the available literature sources are eligible for use (as stipulated by the CDM TOOL30), the sources are fairly old, published in 2012 and 2013 respectively, and may not accurately reflect the current conditions.²⁵ A field baseline survey was therefore recommended and carried out.

The sample size and selection were determined in accordance with the CDM guidance on "Sampling and surveys for CDM project activities and programmes of activities v04.0" with a 90/10 confidence/precision level. The number of households, population and average household size in the region was considered. The sample size of 271 was derived based on the total population of 1 951 122, with expected mean of 20, SD of 20, Z-multiplier 1.645 and relative precision of 10%. A sample of 300 households were selected on a simple random sampling basis across 20 villages within the PI boundary. The Kitchen Performance Test protocol v4.0²⁶ of the Clean Cooking Alliance was followed and included a qualitative habit survey and daily wood use measurements over four consecutive days.

The fNRB has been calculated according to the provision of the VCS methodology VMR0006, Methodology for Installation of High Efficiency Firewood Cookstoves, Version 1.1.²⁷ VMR0006 requires the use of the CDM's TOOL30 "Calculation of the fraction

²³ Promethium Carbon. 2021-03-31. Desktop Study: Biomass Baseline for Cookstove Project in the Kruger to Canyon and Waterberg Biospheres.

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

²⁵ Promethium Carbon. 2021-03-31. Desktop Study: Biomass Baseline for Cookstove Project in the Kruger to Canyon and Waterberg Biospheres.

²⁶ Bailis, R., Thompson, R., Lam, N., Berrueta, V., Muhwezi, G. & Adams, E. 2018. Kitchen Performance Test (KPT) v4.0. Clean Cooking Alliance. 16p.

²⁷ VMR0006: Methodology for Installation of High Efficiency Firewood Cookstoves. Available online at: <https://verra.org/methodology/vmr0006-methodology-for-installation-of-high-efficiency-firewood-cookstoves/>

of non-renewable biomass” Version 3.0.²⁸ The ex-ante approach was followed in accordance with section 3.9 of TOOL30.

TOOL30 also provides for the use of a default factor for fNRB of 0.3 (30%), in the absence of available data sources. This default value was not however applied as it is not considered to accurately reflect the fNRB in the areas in question. TOOL30 provides for the calculation of the project specific fNRB on a regional basis, which includes the utilisation of recent, national and local government statistics. The quantity of NRB has therefore been determined by calculating the total consumption of wood (H) in the Waterberg region and then deducting the quantity of renewable biomass (RB) from this value. The calculations are contained in Excel format²⁹. The fNRB, calculated with the desktop baseline survey results (H) was then updated to include the results of the subsequent field baseline results, as per the recommendations of the report.

The results from the field baseline survey and updated fNRB calculations were³⁰:

H = 5.00 t/house/year

fNRB = 0.99

PI2-WB: Local Stakeholder Engagements

Throughout the project lifecycle, local stakeholders are consulted via online webinars, physical stakeholder consultation meetings and sensitisation engagements. A list of these engagements are provided in Table 1 in Section 2.2 of this document. Meeting reports, attendance registers and feedback is provided in an addendum to this document.³¹

These meetings are conducted by TASC and the relevant PI Implementation Partner. TASC will be partnering with Implementation Partners (IP), who have a proven track record of implementing and managing projects in the project instance boundary. Working with the IPs throughout the project lifecycle (from design, to implementation, and to the monitoring, reporting and verification (MRV) cycles), enables constant on-the-ground interaction and communication with local stakeholders. The IPs also have several local employees who live in the target communities, and can receive and communicate feedback from local stakeholders to the IP and to TASC.

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 2022-03-15 Values for baseline and fNRB calculation v2_Promethium_Field update

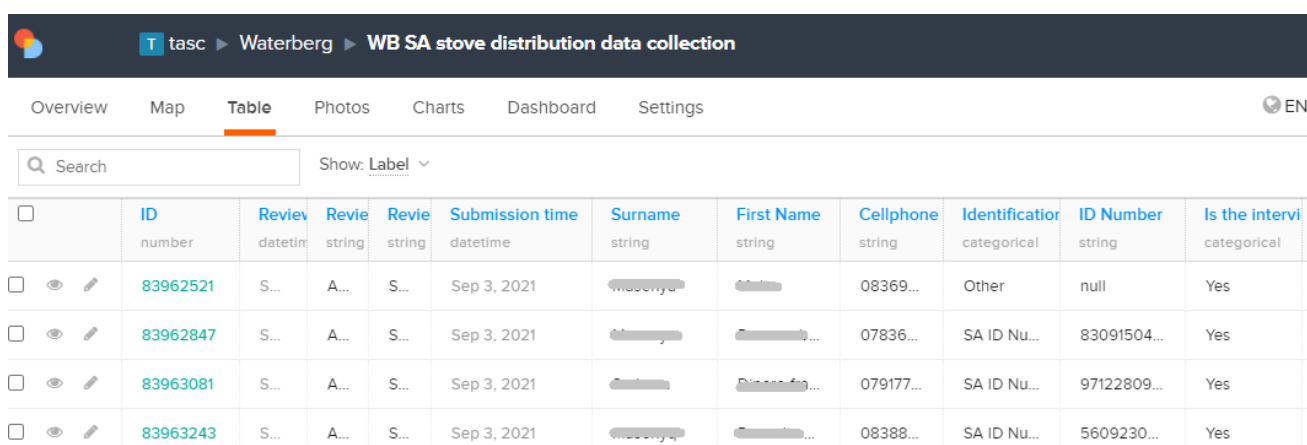
³⁰ Kok, L. 2021. Field Baseline Report – Waterberg. Fuel Efficient Cooking in South Africa. TASC.

³¹ Local Stakeholder Consultation_Waterberg Report.

In PI2-WB, the Implementation Partner is Mogalakwena Training (Pty) Ltd, which was established in July 2011 to promote and provide services in sustainable development in local communities within the Waterberg Region. The team from Mogalakwena Training support TASC in identifying local stakeholders and running local meetings to communicate the non-technical description of the project and project information in a culturally appropriate manner. Communication channels are provided at all meetings and available on the How-To Guide, the meeting invitations and the Non-technical summary, which are included in the stakeholder engagement report.

3.4.5 Evidences of Compliance to Eligibility criterion 12- PI2-WB

PI2-WB: Start Date



The screenshot shows a web application interface for 'tasc Waterberg WB SA stove distribution data collection'. It features a navigation bar with 'Overview', 'Map', 'Table' (selected), 'Photos', 'Charts', 'Dashboard', and 'Settings'. Below the navigation bar is a search bar and a 'Show: Label' dropdown. The main content is a table with the following columns: ID number, Review datetime, Review string, Review string, Submission time datetime, Surname string, First Name string, Cellphone string, Identification categorical, ID Number string, and Is the interview categorical. The table contains four rows of data, each with a checkbox, an eye icon, and a pencil icon in the first column. The data rows are as follows:

	ID number	Review datetime	Review string	Review string	Submission time datetime	Surname string	First Name string	Cellphone string	Identification categorical	ID Number string	Is the interview categorical
☐  	83962521	S...	A...	S...	Sep 3, 2021	Masanya	Masanya	08369...	Other	null	Yes
☐  	83962847	S...	A...	S...	Sep 3, 2021	Masanya	Masanya	07836...	SA ID Nu...	83091504...	Yes
☐  	83963081	S...	A...	S...	Sep 3, 2021	Masanya	Masanya	079177...	SA ID Nu...	97122809...	Yes
☐  	83963243	S...	A...	S...	Sep 3, 2021	Masanya	Masanya	08388...	SA ID Nu...	5609230...	Yes

Figure : Screenshot of the first entries into PI2-WB distribution database

4 DATA AND PARAMETERS

4.2 Data and Parameters Available at Validation

Data / Parameter	Bold
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 ^{32 33}
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
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” ^{34,35}
Value applied	0.89 for PI1-K2C 0.99 for PI2-WB

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

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

³⁴ 2021-03-31 Values for baseline and fNRB calculation v1_Promethium_Field baseline values

³⁵ Promethium Carbon. 2021-03-31. Desktop Study: Biomass Baseline for Cookstove Project in the Kruger to Canyon and Waterberg Biospheres.

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 ³⁶ .
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: ³⁷ 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: ³⁸ IPCC default for wood fuel
Value applied	26.23
Justification of choice of data or description of	Default

³⁶ 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>

³⁷ Available at: <https://verra.org/methodology/vmr0006-methodology-for-installation-of-high-efficiency-firewood-cookstoves/>

³⁸ Available at: <https://verra.org/methodology/vmr0006-methodology-for-installation-of-high-efficiency-firewood-cookstoves/>

measurement methods and procedures applied	
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 ³⁹
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.
Comments	

4.3 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	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.

³⁹ 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	93,859
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	$\eta_{\text{new}, i, j}$
Data unit	Fraction
Description	Efficiency of the device of each type <i>i</i> and batch <i>j</i> 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.

	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 phases⁴⁰. 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	36%
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. 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 5
Comments	See emissions reductions calculation sheet for details.
Data / Parameter	$B_{y=1,new,i,j,survey}$
Data unit	Tonnes

⁴⁰ 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	Determined in the first year of project implementation
Value monitored	-
Monitoring equipment	As specified in KPT protocol
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 $\eta_{new,i,y}$ is determined through Equation 5 in the methodology.
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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.⁴¹

⁴¹ 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 one every two years
Value monitored	0.47
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	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. - 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 woodfuel 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 ⁴²
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.

⁴² Rocket Works Stove Longevity. 2021.

	The actual operation of stoves is monitored via parameter <i>Ny,t,j</i> 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	-

4.4 Monitoring Plan

4.4.1 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, 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 PIs⁴³. 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 parameters $N_{y,i,j}$ 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 114,716 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

⁴³ 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.

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

Using the CDM Survey Sample Calculator v03.1, 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	114,716
Predicted sample size, n	89

For **py**, the sample size was determined according to Section 8.4 Option (b) of the VMR0006 methodology, i.e. Project target population > 1000: Minimum sample size 100. The larger sample size of the two parameters was selected to survey the parameters in one survey. 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.

4.4.2 Data Recording

Field-based monitoring activities to determine monitored parameter values was a field survey.

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.

4.4.3 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.

4.4.4 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.

4.4.5 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 November and December 2021. Oversampling resulted in 176 households surveyed. The survey database, which includes the GPS coordinates of each survey is submitted with this monitoring report.

Analysis of survey questions for parameter $N_{y,ij}$, indicated a 0.818 proportion 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. The survey results meet the precision requirements at 7% according to the CDM Survey Sample Calculator and shown below.

Actual sample size	176
Sample proportion	0.818
Standard error of the proportion	0.0291
Precision associated with a proportion	0.0570
Relative precision	7.0%

Continued use of baseline stoves in addition to project stoves indicated a proportion of 0.47 of baseline stove usage (μ_y). This was determined by surveying the amount of times a beneficiary cooks on the project stove in a week and how many times a week on other stoves.

4.4.6 Implementation Plan

The implementation of this monitoring plan is the responsibility of the 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.

5 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

5.2 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.

5.3 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.

5.4 Leakage

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

5.5 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 methodology, for project activities replacing baseline stoves using non-renewable biomass (firewood/charcoal):

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

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

$$ER_{y,i,j} = B_{y,savings,i,j} \times NCV_{wood\ fuel} \times f_{NRB,y} \times (EF_{wf,CO_2} + EF_{wf,nonCO_2}) \times N_{y,i,j} \times 0.95$$

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 implementation of improved cookstoves can be estimated by one of the following options set out in Equations 3 and 4:

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

Equation (3)

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

Equation (4)

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

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

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

$B_{old,adjusted}$	=	Adjusted B_{old} to account the ex post usage of firewood in baseline cookstove(s) by project households in addition to improved cookstove (in tonnes per device)
μ_y	=	Baseline stove usage factor to account for use of baseline cookstoves along with improved cookstoves.

The quantity of firewood consumed in absence of 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

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.

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

Example calculations for PI2-WB:

Each Project Instance will provide a study of the PI-level baseline scenario, either from public sources (where such data may be available) or field studies.

In order to calculate the annual quantity of ERs, the fixed parameters and example calculations for PI2-WB is outlined below.

Table 4. The fixed parameters for PI2-WB.

Parameter	Units	Fixed Project Parameters	Description	Source
$EF_{wf,co2}$	tCO ₂ e/TJ	112	CO ₂ emission factor of biomass that is substituted or reduced	VMR0006 default
$EF_{wf,non-CO2}$	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
DF	Fraction	0.95	Default leakage adjustment factor	VMR0006 default
B_{old}	Tonnes/yr	5.00	Quantity of biomass consumed in baseline	Field baseline survey for PI2-WB
$F_{NRB,b,y}$	Fraction	0.99	Fraction of biomass used in baseline scenario, which can be established as non-renewable	fNRB study for PI2-WB
η_p	Fraction	38.3%	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 distributed in PI2-WB)
DF	Fraction	0.99	Default value considered for discount factor to account for efficiency loss of project cookstove per year of operation.	VMR0006 default

Example calculations:

To determine the efficiency of project stoves and accounting for efficiency loss of the project stoves, Equation 5 was used:

η_p	DF	y	DF	$\eta_{New,y}$
0.383	0.99	1	0.94	0.360

$B_{old,adjusted}$ is then determined through Equation 6:

B_{old}	μ_y	$B_{old,adjusted}$
5.00	0.47	2.651

$B_{y,savings,i,j}$ (tonnes per ICS per annum) was then determined via Equation 3:

$B_{old,adjusted}$	η_{old}	$\eta_{new,i,j}$	$B_{y,savings,i,j}$
2.651	0.1	0.360	1.915

$ER_{y,i,j}$ (tonnes per ICS per annum) was then determined via Equation 2 for Year 1:

$B_{y,savings,i,j}$	NCV_{wood} fuel	$fNRB_y$	$EF_{wf,co2}$	$EF_{wf,nonCO2}$	$N_{y,i,j}$	DF	$ER_{y,i,j}$
1.915	0.0156	0.99	112	26.23	0.818	0.95	3.883

A breakdown of the number of stoves disseminated in the two PIs in the crediting period is shown below:

Year	PI1-K2C	PI2-WB
2021	66,566	21,083
2022	17,235	9,832
Total	83,801	30,915

A summary of the net GHG emission reductions and removals is tabulated below:

A summary of the net GHG ERs for PI1-K2C

Year	Baseline emissions or removals (tCO ₂ e)	Project emissions or removals (tCO ₂ e)	Leakage emissions (tCO ₂ e)	Net GHG emission reductions or removals (tCO ₂ e)
2021	74,873	0	0	74,873
2022	2,924	0	0	2,924
Total	77,797	0	0	77,797

A summary of the net GHG ERs for PI2-WB

Year	Baseline emissions or	Project emissions or removals (tCO ₂ e)	Leakage emissions (tCO ₂ e)	Net GHG emission reductions or
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	removals (tCO ₂ e)			removals (tCO ₂ e)
2021	24,122	0	0	24,122
2022	1,928	0	0	1,928
Total	26,050	0	0	26,050

A summary of the net GHG ERs for the GP:

Year	Baseline emissions or removals (tCO ₂ e)	Project emissions or removals (tCO ₂ e)	Leakage emissions (tCO ₂ e)	Net GHG emission reductions or removals (tCO ₂ e)
2021	98,995	0	0	98,995
2022	4,852	0	0	4,852
Total	103,847	0	0	103,847