



**Verified Carbon
Standard**

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 Project

Fuel Efficient Cooking in South Africa by TASC is a grouped project aimed at distributing fuel efficient improved cookstoves (ICS) and/or heat retention devices (HRD) to local communities in South Africa. Household cooking practices in South Africa include the use of electric stoves (electricity generated through coal combustion), gas, paraffin, coal and wood. Through this project, ICS/HRD will replace baseline open-fire wood-fueled cooking methods.

Summary description of the technologies and measures to be implemented by the project.

The ICS design has a stainless-steel insulated combustion chamber, small chimney and air inlets, which allows constant air inflow and improves combustion efficiency. Thermal transfer from the stove to the pot is increased. This highly effective stove uses less biomass fuel, emits less smoke, and can boil 5 liters of water in 15 minutes using 250g wood. The implementation of the ICS is estimated to reduce the amount of wood cutting, as well as the amount of time women and children spend foraging for firewood. The ICS reduce GHG emissions through the improved combustion efficiency of the stove. The convection-fueled air duct allows the further burning of smoke in the combustion process. Use of the ICS improve air quality during cooking when compared to open-fire methods, which decreases related health risks from smoke inhalation and from biomass burning emissions. The stoves distributed in this project have a thermal efficiency of more than 25% as required in the methodology followed. The reduced wood fuel demand from ICS use would also assist in decreasing the pressure from wood cutting on the biodiversity in the region.

The HRD distributed with the ICS is intended to address the need of more than one cooking device per household and to reduce stacking of stoves by enabling the cook to prepare multiple dishes at the same time. The HRD consists of a thermal insulated blanket/bag that wraps around a pot that was heated to boiling point on the ICS. Inside of the HRD, the meal continues to cook. The HRD can keep the pot content above 65°C for at least 7 hours. The HRD is therefore ideal for slow-cooker recipes, cooking local starches, or precooking meals (e.g. preparing breakfast the night before).

Project location

The project will distribute ICS to communities identified in several regions within South Africa. The project instances of this grouped project activity will occur in geographically defined regions within South Africa. The details of the project and project instances locations are provided in Section 1.12.

An explanation of how the project is expected to generate GHG emission reductions or removals.

This grouped project will follow the VCS Methodology from Sectoral Scope 3 - *VMR006 Methodology for Installation of High Efficiency Firewood Cookstoves v1.0*, building on the CDM Methodology - *AMS II.G version 11.1: Energy efficiency measures in thermal applications of non-renewable biomass*.

The technologies employed in each project instance will reduce GHG emissions by demonstrably reducing the usage of non-renewable biomass at the household level.

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

The continuation of the baseline scenario would see:

1. an increase in wood-fuel use and degradation of biodiversity in the region.
2. Increased walking distance and time for mainly women and children to harvest wood for cooking.
3. continued wood cutting practices and use of non-renewable wood fuel by the target population to meet the thermal energy needs for cooking.

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

The average annual and total GHG emission reduction from the project is expected to be 2,830,189.81 and 28,301,898.09 tCO₂e, respectively.

1.2 Sectoral Scope and Project Type

The project is categorized as following:

- a) Sectoral Scope 03 – Energy demand
- b) Type II – Energy efficiency improvement projects

The project is designed as a grouped project that includes several instances of the same project activity into one Project Description. New instances can be introduced after the initial start of the project with a project instance defined as: Distribution of efficient cookstoves and/or heat retention devices to a local community within a specific geographic and climatic region.

1.3 Project Eligibility

The project involves ICS/HRD distribution under the approved methodology: *Methodology for Installation of High Efficiency Firewood Cookstoves* (VMR006). The following applicability conditions of this methodology will be met through this project:

- Project activities shall be implemented in domestic premises or in community-based kitchens.

- The ICS/HRD distributed in this project derives energy solely from woody biomass.
- The thermal efficiency of the stoves exceeds the required thermal efficiency of at least 25%.
- Non-renewable biomass has been used in the project region since 31 December 1989.
- Biomass residues are not processed as a fuel for this project.

As per this methodology, the additional applicability criteria numbers 8 and 9 set out in Section 2.2 of AMS II.G version 11.1 will be met through this project also:

- In order to avoid double counting of emission reductions through the method of distribution, each ICS/HRD has a unique identifier number and the distribution of each device is logged onto a database which includes unique information for each recipient (i.e. National identification number, geographic coordinates, etc.).
- To avoid double counting of emission reductions, rights to the emission reductions are transferred via a signed agreement stating that ER/VCUs are the sole property of TASC LTD.

1.4 Project Design

The project is a grouped project.

Eligibility Criteria

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

No	Criterion	How the new project activity instances comply	Evidence
1	Project Instances (PIs) must meet the applicability conditions set out in the applied methodology.	New project instances will meet the applicability conditions set out in Section 4 of the methodology	
1a	Project activities shall be implemented in domestic premises or in community-based kitchens.	Each PI will distribute technology that is appropriate for domestic use to household end users	a) The manufacturer's technology description.

			b) The monitoring database containing unique household end user information.
1b	The ICS/HRD distributed in this project derives energy solely from woody biomass.	Each PI will record the baseline and project fuel use to ensure that wood fuel is the sole source of energy.	a) End users will be asked to state their source of energy at the point of distribution. b) This information will be stored in the monitoring database.
1c	The thermal efficiency of the ICS exceeds the required thermal efficiency of at least 25%.	ICS distributed in each PI will have a thermal efficiency of at least 25%	a) A manufacturer's technology description will certify the thermal efficiency of the ICS
1d	Non-renewable biomass has been used in the project region since 31 December 1989.	Each PI will demonstrate that Non-renewable biomass has been used in the project region since 31 December 1989.	a) Publicly available studies will be used to ascertain biomass usage in the Project Instance design document. See section 3.2.
1e	Biomass residues are not processed as a fuel for this project.	Each PI will record the baseline and project fuel use to ensure that no processed fuel is used.	a) End users will be asked to state their source of energy and baseline appliance at the point of distribution and during the project monitoring. b) This information will be stored in the monitoring database.
1f	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	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	a) Distribution data will be captured at the point of distribution and electronically submitted. b) This information will be stored in the monitoring database.

	number, geographic coordinates, etc.).	c) GPS coordinates of the end user (where possible) d) Available end user data: name, phone number, address/physical location, ID number	
1g	To avoid double counting of emission reductions, rights to the emission reductions are transferred via a signed contract stating that ER/VCUs are the sole property of TASC LTD.	Each PI will have system for avoiding double counting with data being collected via a smartphone app (where possible), or via paper forms. This system will contain an End User Agreement confirming the ownership rights of the ER/VCUs generated by the PI and will require the signature of each end user. 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.	a) End users will be asked to sign the End User Agreement. b) This information will be stored in the monitoring database.
2	Use the technologies or measures specified in the project description.	Only ICS/HRD that conforms with the grouped project description are to be distributed in the project. The ICS/HRD will be chosen to deliver a level of service at least equivalent to the baseline appliance.	The manufacturer's technology description.
3	Apply the technologies or measures in the same manner as specified in the project description.	The ICS/HRD distributed in the project instances will adhere to the grouped project description and replace biomass burned in the baseline scenario.	a) The manufacturer's technology description will describe the technology applicability. 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 database.
4	Are subject to the baseline scenario determined in the project description for the specified project activity and geographic area.	The new project activity instances will be installed only in regions within the geographic borders of South Africa subject to the same baseline scenario determined in Section 3.4 in this Project Description.	a) GPS/location data captured from each end user will demonstrate the location of the project. b) This information will be stored in the monitoring database.
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. 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.	a) An analysis of South African government programmes or policy for cookstoves will be conducted in the Project Instance design document. See Section 3.5. b) The End User Agreement will confirm that the PI “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”.
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	The VMR0006 methodology does not contain a capacity limit. The AMS II.G v.11 methodology lists a capacity limit of “<i>aggregate energy savings of a single project activity shall not exceed the equivalent of 60 GWh per year or 180 GWh thermal per year in fuel input</i>”	The monitoring report and ER calculations for each PI will demonstrate that each ICS/HRD is a microscale unit and therefore not subject to the capacity limit requirements.

	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 of the clusters to exceed the capacity limit.	Correspondingly, Project Instances will apply CDM Tool 19 version 09.0, whereby each ICS/HRD distributed is considered a 'microscale unit' and will not achieve energy savings at a scale of more than 20 GWh per year. Using this tool (as per para 14), it is not necessary to apply the CDM threshold (capacity limit) at the aggregate level of the Project Instance, if the microscale unit limit is not exceeded.	
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1.5 Project Proponent

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

1.6 Other Entities Involved in the Project

TASC SA Ltd. is the sole entity involved in the project.

1.7 Ownership

The project ownership is with TASC SA (Pty) Ltd. During the distribution of the ICS/HRD, the participating household will sign an End User Agreement to confirm that the ownership rights of the carbon assets generated from this project lie with the project proponent.

1.8 Project Start Date

Estimated commissioning date of the first batch ICS is 15 May 2021.

1.9 Project Crediting Period

Crediting Period: Fixed

Total number of years: 10 years

Start and End Date: 15 May 2021 to 14 May 2031

1.10 Project Scale and Estimated GHG Emission Reductions or Removals

Project Scale	
Project	
Large project	X

Year	Estimated GHG emission reductions or removals (tCO _{2e})
Year 1	2,881,951.01
Year 2	2,870,755.48
Year 3	2,859,446.86
Year 4	2,848,024.02
Year 5	2,836,485.79
Year 6	2,824,831.02
Year 7	2,813,058.52

Year 8	2,801,167.10
Year 9	2,789,155.58
Year 10	2,777,022.72
Total estimated ERs	28,301,898.09
Total number of crediting years	10
Average annual ERs	2,830,189.81

1.11 Description of the Project Activity

Project activity description (including the technologies or measures employed) and how it/they will achieve net GHG emission reductions or removals.

The project activity included in this project description is the distribution and installation of one of, or a combination of, high efficiency ICS and HRD in project instances within South Africa.

The ICSs will be based on a “rocket stove” design 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 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 thereby also reduced, saving time for especially women to engage in other economic driven activities.

The HRDs distributed through this project insulate a pot that has already been heated to boiling point on the ICS, to enable further cooking of the dish without additional fuel being used. The fuel wood savings of the HRD, and when the ICS and HRD are used in conjunction, will be demonstrated via a Kitchen Performance Test (KPT) as outlined in AMS-II.G v11.1 Paragraph 26b, Option 2. The HRD reduces the risk of stove stacking and reduces fuel wood use when households cook multiple dishes per meal.

List of main manufacturing/production technologies arrangements, systems and equipment involved.

Detailed application and information on the ICS and HRD technology will be described in the Project Instance PD. The PP will source the best available technologies for distribution under the PoA. The ICS/HRD model selection at Project Instance level will be based on key

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

attributes such as thermal efficiency, durability, cultural acceptability, and manufacturing quality and warranty. New models will be distributed.

No improvement projects are being implemented under the baseline scenario. Wood fuel use has steadily been increasing as economic pressure has been increasing. The distance to wood harvesting sites increases ever more as fuel demand increase. The wood cutting practices are changing the biodiversity in the region¹.

List the types and levels of service

Level of Service: Project Instances will provide ICS based on the ‘rocket stove’ design, delivering a level of service at least equivalent to the baseline appliance (open fire used for household cooking). The HRD devices will further augment this by providing an enhanced level of service additional to the ICS. Each model of ICS/HRD distributed under the Project Instance will be specified in the monitoring report.

Type of Service: The ICS technology will deliver a specified high-power thermal efficiency of at least 25% and evidenced by a manufacturer’s specification and WBT certificate. This is a significant improvement on the baseline open fire thermal efficiency default of 10% (as per AMS II.G). The ICS/HRD combination will further enhance this type of service, further reducing non-renewable biomass usage, demonstrated by the KTP results.

List of facilities, systems and equipment in operation under the existing scenario prior to the implementation of the project.

Under the baseline scenario, households use non-renewable woody biomass for their fuel needs. The baseline appliance being replaced by the project is an open fire (typically based on the three-stone concept).

1.12 Project Location

For each project instance, the project boundary will be defined as being within the geographic borders of the Republic of South Africa. Several distinct climatic regions have been identified which will impact the baseline data of each project instance (Figure 1.1). The coordinates of the South Africa are:

Latitude: -28.48322

Longitude: 24.676997

¹ Swemmer, A.M., Mashele, M. & Ndhlovu, P.D. 2019. Evidence for ecological sustainability of fuelwood harvesting at a village in South Africa. *Regional Environmental Change* 19:403-413. <https://doi.org/10.1007/s10113-018-1402-y>

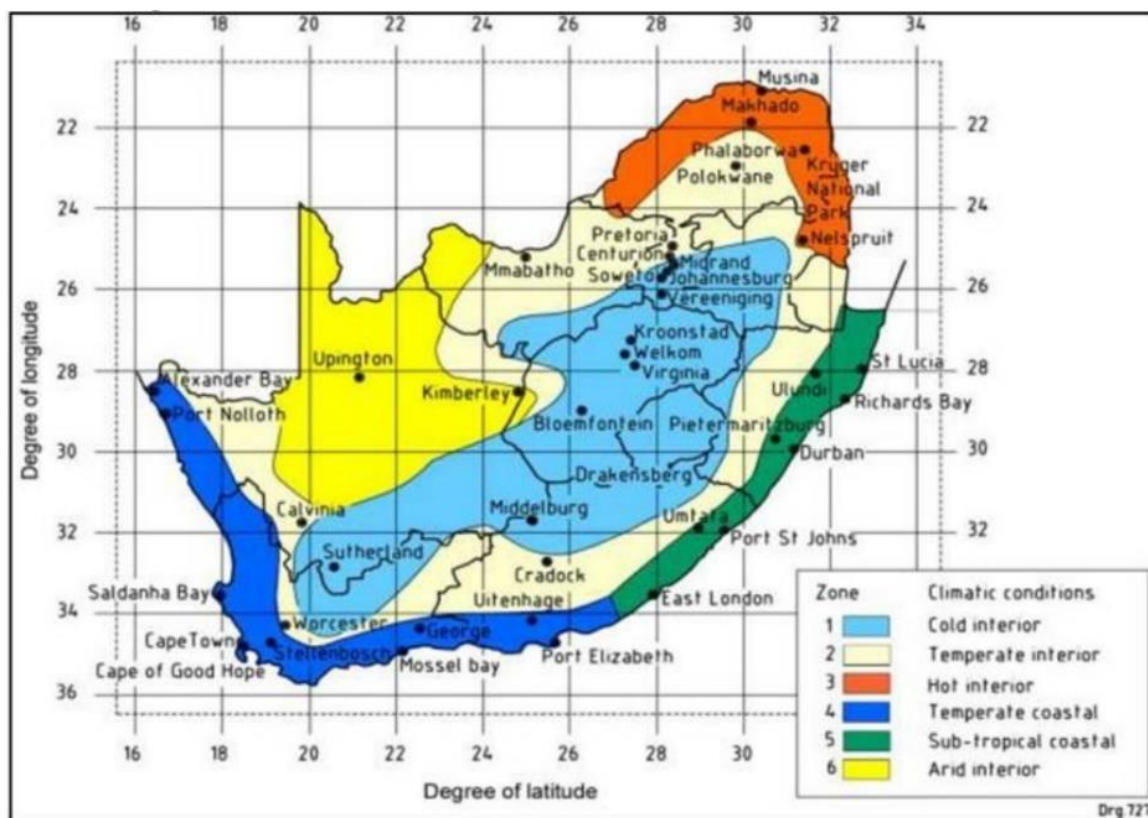


Figure 1.1. Climatic regions identified within the Project Boundary of South Africa.

1.13 Conditions Prior to Project Initiation

The conditions prior to project initiation are the use of non-renewable biomass (wood fuel) to generate thermal energy for cooking. The baseline scenario is the same as the conditions existing prior to the project initiation. See Section 3.2.

1.14 Compliance with Laws, Statutes and Other Regulatory Frameworks

There are no laws or regulations for the use of improved cookstoves in South African households.

1.15 Participation under Other GHG Programs

1.15.1 Projects Registered (or seeking registration) under Other GHG Program(s)

The project has not been registered or seeking registration under any other GHG programs.

1.15.2 Projects Rejected by Other GHG Programs

The project has not been rejected by any other GHG program.

1.16 Other Forms of Credit

1.16.1 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.

1.16.2 Other Forms of Environmental Credit

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

1.17 Additional Information Relevant to the Project

Leakage Management

The project adopts a gross-to-net adjustment factor of 95% on emissions reductions to account for leakage as described under the CDM Methodology: AMS-II.G.v11.0 “Energy efficiency measures in thermal applications of non-renewable biomass”.

Commercially Sensitive Information

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

Sustainable Development

From the Priorities listed in the Sustainable Development Goals Country Report 2019 – South Africa¹, this project will contribute to the SDG priorities in the following ways:

a) Social sustainability

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

b) Economic sustainability

- Reduced wood fuel consumption results in savings on firewood purchases and/or travel costs to acquire resources.

¹http://www.statssa.gov.za/MDG/SDGs_Country_Report_2019_South_Africa.pdf

- Time saved from wood fuel harvesting can be used in economic driven activities.
 - Employment of local people throughout the manufacturing, distribution and monitoring of the project.
- c) Environmental sustainability
- Reduce GHG emissions.
 - Reduce wood cutting which leads to deforestation and loss of biodiversity. Promote sustainable ecosystems and ecological balance.
 - Protection of vegetation ensures better maintenance of water table levels, prevents soil erosion, flash flooding and maintenance of watersheds.
 - 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.

Further Information

Not applicable.

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

[LSC is currently being conducted at the time of writing this version of the PD]

Procedures or methods used for engaging local stakeholders

A plan for local stakeholder consultation amid the Covid-19 pandemic was submitted by the PP and has been approved by Verra.

The proposed plan is included below:

TASC is developing a new Grouped Project in South Africa under the Verra methodology VMR0006: Methodology for Installation of High Efficiency Firewood Cookstoves.

The current Covid 19 situation and related regulations in South Africa does not currently allow for physical gatherings of large groups of people. Therefore, TASC is proposing the following measures to engage local stakeholders, while complying with the Verra VCS Standard:

Local Stakeholder Consultation

3.16.2 The project proponent shall conduct a local stakeholder consultation prior to validation as a way to inform the design of the project and maximize participation from stakeholders. Such consultations allow stakeholders to evaluate impacts, raise concerns about potential negative impacts and provide input on the project design.

Local stakeholder consultations (LSCs) will be arranged prior to the project validation to inform stakeholders of the project design, and to maximise participation and input from local stakeholders.

These LSCs will be conducted via small gatherings if permitted by and in accordance with national lockdown restrictions. To effectively maximize the number of stakeholders reached, the LSCs will also be conducted via a Zoom video conferencing session. Stakeholders identified as not having access to stable internet connection will be invited to a small, physical LSC meetings. Stakeholders unable to attend the physical or Zoom meetings will be notified about the project via email and their feedback or input requested.

Stakeholders will be invited via email, or via physical or telephonic invitation with the help of the on-the-ground implementation partners (IPs). The following information will be included in the LSC meetings and emails:

- i. Non-technical summary of the project in English and project instance- applicable official local languages;
- ii. Monitoring and validation/verification process information;
- iii. Grievance procedures;
- iv. Contact details of TASC, and of the IP;
- v. Feedback form

3.16.3 The project proponent shall establish mechanisms for ongoing communication with local stakeholders to allow stakeholders to raise concerns about potential negative impacts during project implementation.

For each Project Instance, TASC will be partnering with local NGOs or NPOs as IPs. These IPs will 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. Each Project Instance will define the way in which each IP communicates about the project with local stakeholders, which will be specific to the operating procedures of each IP. This may include:

- Regular community meetings
- Field staff visits to End Users
- Call centre operations
- Radio/press announcements
- SMS/WhatsApp/email communications etc.

Communication channels and contact details of TASC will also be made available in all communications, training and sensitization sessions, and at any interaction points with local stakeholders for inputs and grievances.

3.16.4 The project proponent shall take due account of all and any input received during the local stakeholder consultation and through ongoing communications, which means it will need to either

update the project design or justify why updates are not appropriate. The project proponent shall demonstrate to the validation/verification body what action it has taken in respect of the local stakeholder consultation as part of the validation, and in respect of ongoing communications as part of each subsequent verification.

A report will be written after each LSC including any input and comments received during the meeting. Action points will be included for each input/comment. Any feedback received from the ongoing communication with local stakeholders will also be reported. These reports will be presented to the validation/verification body as part of the validation and verification processes.

Local Stakeholder Identification and Background

3.16.11 The project proponent shall conduct a thorough assessment of the local stakeholders that will be impacted by the project. The project description shall include information on local stakeholders at the start of the project, including:

- 1) The process(es) used to identify local stakeholders likely impacted by the project and a list of such stakeholders;*
- 2) Identification of any legal or customary tenure/access rights to territories and resources, including collective and/or conflicting rights, held by local stakeholders;*
- 3) A description of the social, economic and cultural diversity within local stakeholder groups and the differences and interactions between the stakeholder groups;*
- 4) Any significant changes in the makeup of local stakeholders over time;*
- 5) The expected changes in well-being and other stakeholder characteristics under the baseline scenario, including changes to ecosystem services identified as important to local stakeholders;*
- 6) The location of communities, local stakeholders and areas outside the project area that are predicted to be impacted by the project; and*
- 7) The location of territories and resources which local stakeholders own or to which they have customary access.*

A thorough assessment of the local stakeholders will be conducted in partnership with each IP and the information listed above will be presented in the project description documents.

Risks to Local Stakeholders

3.16.12 The project proponent shall identify likely natural and human-induced risks to local stakeholder well-being expected during the project lifetime and outline measures needed to mitigate these risks.

No natural and human-induced risks to local stakeholder well-being is expected arising from the project implementation during the project lifecycle.

3.16.13 The project proponent shall identify the risks for local stakeholders to participate in the project, including project design and consultation. Risks should include trade-offs with food security, land loss, loss of yields and climate change adaptation. The project shall be designed and implemented to avoid trade-offs and manage the identified risks to local stakeholders.

The project design and implementation does not involve any trade-offs or risks to local stakeholders.

3.16.14 The project proponent or any other entity involved in project design or implementation shall not be involved in any form of discrimination or sexual harassment.

This project will not include any form of discrimination or sexual harassment.

3.16.15 The management teams involved in the project shall have expertise and prior experience implementing land management and carbon projects with community engagement at the project scale. Where relevant experience is lacking, the project proponent shall either demonstrate how they have partnered with other organizations to support the project or have a recruitment strategy to fill the identified gaps.

The TASC team has over 10 years' experience in developing clean cooking carbon programmes in sub-Saharan Africa where significant community engagement is required. TASC's CDM Programme of Activities; Fuel Efficient Stoves in Zambia (developed by a subsidiary – 3 Rocks Ltd.) was registered in 2013 and is also registered under the VCS.

Respect for Local Stakeholder Resources

3.16.16 The project proponent shall avoid negative impacts of project implementation and mitigate impacts when unavoidable, including the following:

- 1) The project proponent shall recognize, respect and support local stakeholders' property rights and where feasible, take measures to help secure rights. The project shall not encroach on private, stakeholder or government property or relocate people off their lands without consent. The project may affect property rights if free, prior and informed consent is obtained from those concerned and a transparent agreement is reached that includes provisions for just and fair compensation. In the event there are any ongoing or unresolved conflicts over property rights, usage or resources, the project shall undertake no activity that could exacerbate the conflict or influence the outcome of an unresolved dispute.*

This project will not affect stakeholder property rights.

- 2) To reduce damage to the ecosystems on which the local stakeholders rely:*

- a) The project shall not introduce any invasive species or allow an invasive species to thrive through project implementation.*
- b) The project shall justify the use of non-native species over native species, explaining the possible adverse effects of non-native species.*
- c) The project shall justify the use of fertilizers, chemical pesticides, biological control agents and other inputs used by the project and their possible adverse effects.*

a) This project aims to improve the ecosystems on which local stakeholders rely by reducing the stress of firewood harvesting on the ecosystem. The project will not introduce any invasive species and will possibly aid in the management and/or reduction of existing invasive species;

b) Not applicable to this project.

c) Not applicable to this project

Communication and Consultation

3.16.17 The project proponent shall take all appropriate measures to communicate and consult with local stakeholders in an ongoing process for the life of the project. The project proponent shall communicate:

- 1) The project design and implementation, including the results of monitoring.*
- 2) The risks, costs and benefits the project may bring to local stakeholders.*
- 3) All relevant laws and regulations covering workers' rights in the host country.*
- 4) The process of VCS Program validation and verification and the validation/verification body's site visit.*

The information listed above will be communicated to the stakeholders in the meetings and correspondence as set out in 3.16.2 above.

3.16.18 The project proponent shall develop a grievance redress procedure to address disputes with local stakeholders that may arise during project planning and implementation, including with regard to benefit sharing. The procedure shall include processes for receiving, hearing, responding and attempting to resolve grievances within a reasonable time period, taking into account culturally-appropriate conflict resolution methods. The procedure and documentation of disputes resolved through the procedure shall be made publicly available. The procedure shall have three stages:

- 1) The project proponent shall attempt to amicably resolve all grievances and provide a written response to the grievances in a manner that is culturally appropriate.*

2) Any grievances that are not resolved by amicable negotiations shall be referred to mediation by a neutral third party.

3) Any grievances that are not resolved through mediation shall be referred either to a) arbitration, to the extent allowed by the laws of the relevant jurisdiction or b) competent courts in the relevant jurisdiction, without prejudice to a party's ability to submit the grievance to a competent supranational adjudicatory body, if any.

A grievance redress mechanism will be developed specifically for each Project Instance and included in the project design documents. Each IP will define a grievance mechanism that is most appropriate to their operations and to the communities within the project boundary.

3.16.19 All communication and consultation shall be performed in a culturally appropriate manner, including language and gender sensitivity, directly with local stakeholders or their legitimate representatives when appropriate. The results of implementation shall be provided in a timely manner and consultation shall be performed prior to design decisions or implementation to allow stakeholders adequate time to respond to the proposed design or action.

All communication and consultation shall take into account the local cultural practices, languages and gender sensitivity. The local IPs will assist in facilitating the communications and consultations with the relevant local stakeholders directly impacted through the project.

2.3 Environmental Impact

No negative environmental impacts have been identified for the project and an environmental impact assessment (EIA) is not required for the project.

2.4 Public Comments

[Public Comment is currently being conducted at the time of writing this version of the PD]

2.5 AFOLU-Specific Safeguards

This section is not applicable as the project is a non-AFOLU project.

3 APPLICATION OF METHODOLOGY

3.1 Title and Reference of Methodology

VMR0006: Methodology for installation of High Efficiency Firewood Cookstoves v1.0.¹

CDM Methodology: AMS-II.G.v11.0 "Energy efficiency measures in thermal applications of non-renewable biomass".²

¹ <https://verra.org/methodology/vmr0006-methodology-for-installation-of-high-efficiency-firewood-cookstoves/>

² <https://cdm.unfccc.int/methodologies/DB/10PELMPDW951SVSW1B2NRCQEBAX96C>

CDM Guideline: Sampling and surveys for CDM project activities and programmes of activities, v4

CDM Tool 19: Demonstration of additionality of microscale project activities, v9

3.2 Applicability of Methodology

VMR0006:

Methodology Applicability Criterion	How the project complies
Project activities shall be implemented in domestic premises or in community-based kitchens.	The project ensures the distribution of ICS/HRD to households only.
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.	The ICS distributed in this project has a thermal efficiency of at least 25%. The manufacturer's specifications will be described in the Project Instance design document.
Both 'Projects' and 'Large Projects' can use the methodology.	The project size is allowed.
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 since 31 December 1989 in South Africa as demonstrated below.
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	Not applicable. The ICS/HRD is distributed as an energy efficiency measure to replace stoves under the baseline stove scenario of burning non-renewable biomass.

considered as equivalent to the upstream emissions associated with the processing of the displaced fossil fuel and hence disregarded	
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Evidence that non-renewable biomass has been used in the project area since 1989

Williams (1986) reported that fuelwood is the sole source of energy for less-developed rural and peri-urban areas in South Africa¹. 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)². 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. In the communal areas of the South African Lowveld, the fuelwood dependence is particularly high, with an average household use of 3-4 tonnes of fuelwood per year (Wessles et al. 2013)³. In sub-Saharan Africa, fuelwood use has steadily increased with population growth (ESMAP, 2020)⁴. In a study by Swemmer et al. (2019), found that fuelwood supply cannot meet the demand in the project area⁵. Therefore, it can be concluded that non-renewable biomass have been used in the project region since December 1989.

3.3 Project Boundary

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

¹ Williams, A.T., 1986. The potential for the production of energy from biomass in South Africa (Master's dissertation, University of Cape Town).

² Durning A., 1991: Saving the forests: what will it take? Worldwatch Paper 117. Worldwatch Institute, Washington DC. ISBN-13: 978-1878071187

³ 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

⁴Energy 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

⁵ Swemmer, A. M., Mashele, M. and Ndhlovu, P. D. (2019) 'Evidence for ecological sustainability of fuelwood harvesting at a rural village in South Africa', *Regional Environmental Change*, 19(2), p. 403. doi: 10.1007/s10113-018-1402-y

Source		Gas	Included?	Justification/Explanation
	Production & Transport of Fuel	CO ₂	Yes	Not applicable. ICS is deployed as energy efficiency measure and not for fuel switch case.
		CH ₄	Yes	Not applicable. ICS is deployed as energy efficiency measure and not for fuel switch case.
		N ₂ O	Yes	Not applicable. ICS is deployed as energy efficiency measure and not for fuel switch case.
		Other	No	No other source identified
Project	Emission from use of non-renewable biomass	CO ₂	Yes	Major source
		CH ₄	Yes	Major source
		N ₂ O	Yes	Major source
		Other	No	No other source identified
	Production & Transport of Fuel	CO ₂	Yes	Not applicable. ICS is deployed as energy efficiency measure and not for fuel switch case.
		CH ₄	Yes	Not applicable. ICS is deployed as energy efficiency measure and not for fuel switch case.
		N ₂ O	Yes	Not applicable. ICS is deployed as energy efficiency measure and not for fuel switch case.
		Other	No	No other source identified

The project boundary is defined within the geographic boundaries of South Africa (see Section 1.12) (Figure 3.1).



Figure 3.1. The project boundary of South Africa.¹

¹ US Dept of State Geographer. Image Landsat/Copernicus. 2020 AfriGIS (Pty) Ltd. Data SIO, NOAA, U.S. Navy, NGA, GEBCO.

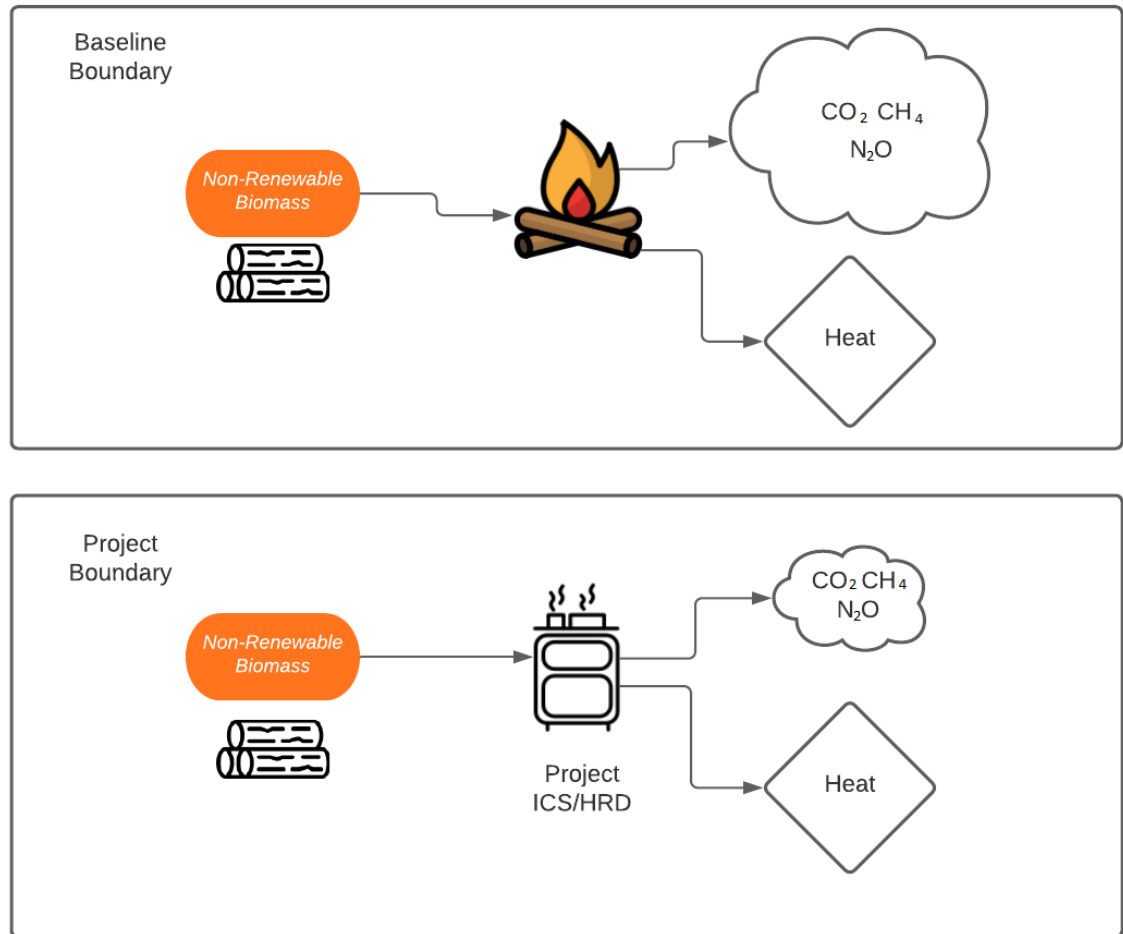


Figure 3.2. The baseline and project boundaries. Within the project boundary, less biomass burning gases and particulates are emitted.

3.4 Baseline Scenario

As per the VMR0006 methodology, the baseline scenario is the continued use of non-renewable wood fuel (firewood) by the target population to meet similar thermal energy needs as provided by project ICS/HRD in absence of project activity.

Individual baseline emissions calculations will be defined in each Project Instance Document.

3.5 Additionality

The methodology VMR006 v1.0 uses activity method for the demonstration of additionality.

Activity Method

Step 1: Regulatory Surplus

There is no mandated government programme or policy in the host country of this project ensuring distribution of domestic fuel-efficient cookstoves. The project is not mandated by any law, statute or regulatory framework, or for the UNFCCC non-Annex I countries, any systematically enforced law, statute or other regulatory framework.

Households may only participate voluntarily in this project. It is hereby confirmed that the proposed project is a voluntary coordinated action by TASC SA (Pty) Ltd.

Step 2: Positive List

The applicability conditions of this methodology represent the positive list. The project meets all of the applicability conditions as described in Section 3.2. The project also meets the following conditions:

1. The project distributes stoves at zero cost to the end-user and has no other source of revenue other than the sale of GHG credits.
2. Project activities are not implemented as part of government schemes nor is the project supported by multilateral funds.

The project can therefore be deemed as additional.

3.6 Methodology Deviations

The project did not apply any methodology deviations.

4 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

4.1 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.

4.2 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.

4.3 Leakage

Leakage shall be considered as default 0.95 in accordance with Section 5.4 of AMS-II.G.v11.1

4.4 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 VMR006 methodology, for project activities replacing baseline stoves using non-renewable biomass (firewood/charcoal):

Equation 1	$ER_y = \sum_i \sum_j ER_{y,i,j}$	
	i	Indices for the situation where more than one type/model of improved cookstove is introduced to replace three stone fire.
	j	Indices for the situation where there is more than one batch of improved cookstove of type i.
	$ER_{y,i,j}$	Emission reductions by improved cookstove of type i and batch j during year y in tCO ₂ e.
	i	Indices for the situation where more than one type/model of improved cookstove is introduced to replace three stone fire.
	j	Indices for the situation where there is more than one batch of improved cookstove of type i.
Equation 2	$ER_{y,i,j} = B_{y,savings,i,j} \times NCV_{wood\ fuel} \times fNRB_y \times (EF_{wf,CO_2} + EF_{wf,nonCO_2}) \times N_{y,i,j} \times 0.95$	
	$B_{y,savings,i,j}$	Quantity of woody biomass that is saved in tonnes per improved cookstove of type i and batch j.

	$NCV_{\text{wood fuel}}$	Net calorific value of the non-renewable woody biomass that is substituted or reduced (IPCC default: 0.0156TJ/tonne).
	f_{NRB_y}	Fraction of woody biomass that can be established as non-renewable biomass.
	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).
	$EF_{wf,nonCO_2}$	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 cookstoves 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:

Equation 3	$B_{y,savings,i,j} = B_{old} \times \left(1 - \frac{\eta_{old}}{\eta_{new,i,j}}\right)$
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The efficiency of the project stoves can be estimated using Equation 5:

Equation 5	$\eta_{new,i,y} = \eta_p \times (DF_n)^{y-1} \times 0.94$	
	η_p	Efficiency of project cookstoves (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 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.

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

Detailed application of the methodology will be described in the Project Instance PD.

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. In instances where an HRD is distributed, biomass is not displaced and need not be apportioned between multiple project stoves while calculating B_{old} .

Equations (i) and (ii) below shall be used for calculating biomass consumed in absence of project activity in case more than one project stove is used in household.

i	$B_{old,i,j} = B_{old,HH} \div N_{d,HH}$	
ii	$B_{old,HH} = B_{old,p} \times N_{p,HH}$	
	$B_{old,HH}$	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
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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 valid.

Where HRD are used in conjunction with ICS, under the AMS-II.G v11.1 methodology, Section 5.3, $B_{y,savings,i,j}$ will be estimated as per Option 2: Kitchen Performance Test (KPT) as calculated by Equation 9.

Equation 9	$B_{y,savings,i,j} = B_{old,i,j} - B_{new,KPT,i,j}$	
	$B_{old,i,j}$	Annual quantity of woody biomass that would have been used in the absence of the project activity to generate useful thermal energy equivalent to that provided by the project device type I and batch j
	$B_{new,KPT,i,j}$	Annual quantity of woody biomass used in tonnes per project device of type I and batch j, measured as per the KPT protocol. The KPT shall be carried out in accordance with national standards (if available) or international standards or guidelines (e.g. the KPT Protocol listed by Clean Cooking Alliance)

Ex-ante calculations (estimates)

Year	Estimated baseline emissions or removals (tCO _{2e})	Estimated project emissions or removals (tCO _{2e})	Estimated leakage emissions (tCO _{2e})	Estimated net GHG emission reductions or removals (tCO _{2e})
Year 1	2,881,951.01	0	0	2,881,951.01
Year 2	2,870,755.48	0	0	2,870,755.48
Year 3	2,859,446.86	0	0	2,859,446.86
Year 4	2,848,024.02	0	0	2,848,024.02
Year 5	2,836,485.79	0	0	2,836,485.79

Year 6	2,824,831.02	0	0	2,824,831.02
Year 7	2,813,058.52	0	0	2,813,058.52
Year 8	2,801,167.10	0	0	2,801,167.10
Year 9	2,789,155.58	0	0	2,789,155.58
Year 10	2,777,022.72	0	0	2,777,022.72
Total	28,301,898.09	0	0	28,301,898.09

Example calculations, data and parameter estimates

Example calculations are based on the first year (y=1) of the grouped project implementation.

In order to calculate the ex-ante annual quantity of biomass that would have been used in the absence of project activity to generate useful thermal energy equivalent to that provided by the ICS (B_{old}), the parameters and estimates below were used.

Below is an analysis of B_{old} conducted at the Grouped Project level. It should be noted that these figures are generated by data drawn from across South Africa as a whole and may be applied in any given Project Instance design document.

Data Label	Description	Data	Unit	Source
A	Household fuelwood consumption	14,771,000	m ³	UN data ¹
B	Density of fuelwood	0.725	t/m ³	FAO ²
C	Household fuelwood consumption	10,708,975	t	calculated (AxB)
D	Population	57,000,451		World Bank ³
E	% using wood fuel	15.2%		Clean Cooking Alliance ⁴
F	Population using wood	8,664,068,552		calculated (DxE)
G	Average annual consumption per capita	1.24	t	calculated (C/F)

¹ http://data.un.org/Data.aspx?d=EDATA&f=cmID%3aFW%3btrID%3a1231#f_1

² <http://www.fao.org/3/a-i6935e.pdf>

³ <https://data.worldbank.org/country/south-africa>

⁴ <https://www.cleancookingalliance.org/country-profiles/37-south-africa.html>

H	Average household size	3.3		SA Community Survey ¹
	B_{old,HH}	4.08	t	calculated (GxH)

Alternatively, each Project Instance may provide a study of more localized baseline data (where such data may be available). An example of such a PI-level analysis has been provided below for the GP's ex-ante emissions reductions calculations:

EX-ante Parameters	Units	Fixed Project Parameters	Description	Source
E _{f,CO2}	tCO ₂ e/TJ	112	CO ₂ emission factor of biomass that is substituted or reduced	VMR006 default
E _{f,non-CO2}	tCO ₂ e/TJ	26.23	Non-CO ₂ emission factor of biomass that is substituted or reduced	VMR006 default
NCV _{biomass}	TJ/tonne of wood	0.0156	Net calorific value of biomass	VMR006 default
η _{old}	fraction	0.1	Efficiency of the baseline cookstove being replaced	VMR006 default
DF	fraction	0.95	Default leakage adjustment factor	VMR006 default
B _{old,i}	tonnes/year	5.49	Quantity of biomass consumed in baseline scenario (tonnes per household per year).	Example used: Field baseline survey at one Project Instance level; final figure to be determined at the Project Instance level.
f _{NRB,b,y}	fraction	0.89	Fraction of biomass used in baseline scenario, which can be established as non-renewable.	Example used: Field baseline survey at one Project Instance level; final figure to be determined at the Project Instance level.
η _p	fraction	38.3%	Efficiency of project cookstove (fraction) determined at the start of the project activity.	Example used: RocketWorks Zama Zama wood stove
DF	fraction	0.99	Default value considered for discount factor to account for efficiency loss of project cookstove per year of operation.	VMR006 default

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

$$\eta_{New,y} = \eta_p \times (DF)^{(y-1)} \times 0.94$$

$$= 0.383 \times (0.99)^{(1-1)} \times 0.94$$

¹ <http://www.statssa.gov.za/publications/03-01-06/03-01-062016.pdf>

$$= 0.360$$

$B_{y,savings}$ for ICS was then determined through Equation 3:

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

$$= 5.490 \times (1 - 0.1/0.360)$$

$$= 3.965 \text{ t/yr}$$

$B_{y,savings}$ was then used in Equation 2 to calculate emission reductions in tonnes per improved cookstove during year y (y=1).

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

$$= 3.965 \times 0.0156 \times 0.89 \times (112 + 26.23) \times 1 \times 0.95$$

$$= 7.205 \text{ tCO}_2\text{e}$$

5 MONITORING

5.1 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 above.
Value applied	5.49
Justification of choice of data or description of measurement methods and procedures applied	This parameter shall be determined at the Project Instance level
Purpose of Data	Calculation of emission reductions in Equations 3,6 & 9.
Comments	Parameter B_{old} once determined shall remain fixed for the entire crediting period.

Data / Parameter	$f_{nr,b,y}$
Data unit	Fraction
Description	Fraction of woody biomass that can be established as non-renewable biomass
Source of data	Calculated – Field baseline survey at one Project Instance level
Value applied	0.89
Justification of choice of data or description of measurement methods and procedures applied	This parameter shall be determined at the Project Instance level
Purpose of Data	Calculation of emission reductions.
Comments	

Data / Parameter	$NCV_{biomass}$
Data unit	<i>TJ/tonne</i>
Description	Net calorific value of the non-renewable woody biomass, renewable biomass, briquettes or pellets used in project devices
Source of data	Default
Value applied	0.0156
Justification of choice of data or description of measurement methods and procedures applied	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.
Purpose of Data	Calculation of emission reductions.
Comments	

Data / Parameter	EF_{WF,CO_2}
Data unit	tCO_2e/TJ
Description	CO_2 emission factor of biomass that is substituted or reduced.

Source of data	Default
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	Default
Value applied	26.23
Justification of choice of data or description of 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	Manufacturer's specification
Value applied	38.3%
Justification of choice of data or description of measurement methods and procedures applied	This parameter shall be determined at the Project Instance level
Purpose of Data	Calculation of $\eta_{new,i,j}$ in Equation 5
Comments	N/A

5.2 Data and Parameters Monitored

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.
Frequency of monitoring/recording	At least once every two years
Value applied	400,000 (<i>example figure</i>)
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 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 data	Calculation of emission reductions in Equation 2
Calculation method	Proportion of operational stoves obtained from the survey is multiplied by the total commissioned stoves to arrive at this value.
Comments	-

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	Project stoves produced in the formal sector do not vary in characteristics such as design, material, critical dimensions, etc. beyond a range of acceptable limits hence efficiency shall be measured as per following: - 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 phases¹². - 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. <i>Efficiency of the improved cookstoves can also be estimated ex-ante using equation 4 above where loss in efficiency per year is calculated, and therefore this parameter does not need to be monitored.</i>
Frequency of monitoring/recording	Either: - Once at the point of distribution; or - Annually

Value applied	38.3% (<i>example value</i>)
Monitoring equipment	When measured: as specified in WBT protocol When calculated: none
QA/QC procedures to be applied	Data from monitoring will be collected annually and applied to the emissions 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 data	Calculation of emission reductions in Equation 3.
Calculation method	Equation 5
Comments	-

Data / Parameter	μy
Data unit	Fraction
Description	<i>Adjustment to account for any continued use of pre-project devices during the year y</i>
Source of data	Monitoring survey
Description of measurement methods and procedures to be applied	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 Bold, adjusted is equal to Bold. - 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. <i>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 is applied to Bold. 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</i>

	be to interview the household and have them estimate the time of usage of the baseline cookstoves and improved cookstove on an average day.
Frequency of monitoring/recording	At least once every two years
Value applied	0
Monitoring equipment	Survey form
QA/QC procedures to be applied	Data from the monitoring survey will be collected annually 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 data	Calculation of emission reduction 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 μ_y is not required to be computed.
Comments	-

Data / Parameter	η_{old}
Data unit	Fraction
Description	Efficiency of baseline reduction
Source of data	• Default • Collected at point of distribution
Description of measurement methods and procedures to be applied	a) 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; b) A default value of 0.2 shall be used for other types of devices. c) 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) <i>If this parameter is surveyed, project promoters may use simplified guidelines stated under Option (b) in Section 4.4 above for arriving at the minimum sample size</i>

Frequency of monitoring/recording	Once at point of distribution
Value applied	0.1
Monitoring equipment	-
QA/QC procedures to be applied	-
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
Equations	5
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
Frequency of monitoring/recording	Once at point of distribution
Value applied	5
Monitoring equipment	-
QA/QC procedures to be applied	-
Purpose of data	Calculation of emissions reductions
Calculation method	-
Comments	-

Data / Parameter	$B_{new,KPT,i,j}$
Data unit	Tonnes
Description	Annual quantity of woody biomass used in tonnes per project device of type i and batch j
Source of data	Sample survey
Description of measurement methods and procedures to be applied	Measured as per the KPT protocol. The KPT shall be carried out in accordance with national standards (if available) or international standards or guidelines (e.g. the KPT Protocol listed by Clean Cooking Alliance. See https://www.cleancookingalliance.org/technology-and-fuels/testing/protocols.html) The days selected for measurement of fuel consumption shall take into account seasonal/weekly variations in fuel consumption, or else the data from the measurement campaign shall be extrapolated in order to take into account the seasonal pattern.
Frequency of monitoring/recording	Annual
Value applied	
Monitoring equipment	Survey forms, weighing scale, moisture meter
QA/QC procedures to be applied	Data from the monitoring survey will be collected annually 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 data	Calculation of emission reductions in Equation 9 (from AMS II.G v11).
Calculation method	-
Comments	-

5.3 Monitoring Plan

5.3.1 Sampling Plan

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

Sampling Design

a. Objectives & Reliability Requirements

Sampling activities are defined at the Grouped Project-level and the sampling plan presented here will apply to assess parameter values in Project Instances to be included in the Grouped Project, either individually or in groups.

In accordance with the Methodology and the Standard, as Project Instances are categorized as CDM small scale, samples will be calculated on a 90/10 for individual Project Instances on an annual basis, or 95/10 confidence/precision basis for groups of Project Instances 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 Project Instances¹. A single sampling plan covering a group of Project Instances is justified when either the homogeneity of included Project Instances relative to the parameters of interest can be demonstrated or the differences among the included Project Instances is taken into account in the sample size calculation.

b. Target Population

The target population is the combined unique entries of ICS/HRD users by Project Instance in the monitoring database from which the sample is being drawn.

c. Sampling Method

For each survey, the sampling method is determined by using a random sample of the total population of distributed ICS/HRD 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/HRD 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.

e. Sampling Frame

The Sampling Frame will be the monitoring database which may contain information from multiple Project Instances and therefore allows for sampling to be taken per Project Instances or as a group of Project Instances.

¹ 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.

5.3.2 Data Recording

Field-based monitoring activities to determine monitored parameter values will be either a field survey, KPT or WBT.

Data shall be recorded for each activity either directly onto a smartphone-based app designed for the purpose, or via paper forms where this is not possible.

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

5.3.3 Organizational Structure

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

Data collection will be conducted by a dedicated monitoring team of trained individuals, either from TASC SA or the Project Instance Implementer. The monitoring team will use a survey questionnaire and instruments required for KPT/WBT measurements on the sampled ICS/HRD.

5.3.4 Quality Assurance/Quality Control

In order to minimize sampling errors, such as non-responses and errors, the field team will practice 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 samples 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.

5.3.5 Analysis

Completed survey questionnaires and KPT/WBT data will be collected by the monitoring team and delivered to the TASC SA Carbon Project Manager for analysis. These shall be checked through for errors and completeness, and compiled into a monitoring report. Any incomplete or missing data shall be documented clearly. The monitoring report will include:

- Summary of activities undertaken, at which location and on which dates
- Summary of data collected and values
- Calculation of the parameter values to be utilized in emissions reduction calculations

5.3.6 Implementation Plan

The implementation of this monitoring plan will be the responsibility of the TASC SA and its specifically trained monitoring team. This team will comprise local operatives who are conversant in local languages and customs of rural South Africa. Individuals will be selected based on their competence and experience for each monitoring activity, and trained accordingly. Training records will be maintained.

There will be no incentives provided for these individuals for the type of data provided, to prevent any conflict of interest.

APPENDIX

Use appendices for supporting information. Delete this appendix (title and instructions) where no appendix is required.