

TEMPLATE

MONITORING REPORT

PUBLICATION DATE **14.10.2020**

VERSION **v. 1.1**

RELATED SUPPORT - **TEMPLATE GUIDE Monitoring Report v. 1.1**

This document contains the following Sections

Key Project Information

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Programme of Activity Information – (delete below table if N/A)

GS ID of Programme	GS5562
Title of Programme	Efficient and Clean Cooking For Mozambican Low-Income Households PoA
Version of POA-DD applicable to this monitoring report	04
Name and GS ID of fully Validated CPA/VPAs (i.e. non compliance check)	Efficient and Clean Cooking for Mozambican Low-Income Households - George Dimitrov VPA1 (GS6155)

Key Project Information

GS ID (s) of Project (s)	GS6155
Title of the project (s) covered by monitoring report	Efficient and Clean Cooking for Mozambican Low-Income Households – George Dimitrov VPA 1
Version number of the PDD/VPA-DD (s) applicable to this monitoring report	3.0
Version number of the monitoring report	08
Completion date of the monitoring report	27/04/2024
Date of project design certification	13/02/2019
Date of Last Annual Report	30/12/2023
Monitoring period number	03
Duration of this monitoring period	30/04/2020 to 31/03/2023 Both first and last day included.
Project Representative	Mozambique Carbon Initiatives LDA (MozCarbon) Contact: Micas Cumbana Address: Avenida Filipe Samuel Magaia No.1675, Maputo Mozambique Email: mcumbana@mozcarbon.co.mz Phone: +25821422188 (reception)
Host Country	Mozambique

Activity Requirements applied	☒ Community Services Activities ☐ Renewable Energy Activities ☐ Land Use and Forestry Activities/Risks & Capacities ☐ N/A
Methodology (ies) applied and version number	AMS-II.G v.10.0: Energy efficiency measures in thermal application of non-renewable biomass. Scope 03.
Product Requirements applied	☒ GHG Emissions Reduction & Sequestration ☐ Renewable Energy Label ☐ N/A

Table 1 - Sustainable Development Contributions Achieved

Sustainable Development Goals Targeted	SDG Impact	Amount Achieved	Units/ Products
SDG #13 Emission Reductions	Emission Reductions	27,314	tCO2e/year
SDG #1 No Poverty	Percentage of decrease of the household monthly cost to buy fuel for cooking.	95.8%	Percentage
SDG #1 No Poverty	Number of staff hired to implement the project activities	184	Number
SDG #3 Good health and wellbeing	Percentage of the users report the reduction of smoke levels in house	93.9%	Percentage
SDG #13	Number of people trained during the project implementation	264	Number

Table 2 – Product Vintages

		Amount Achieved		
Start Dates	End Dates	VER	N/A	N/A
30/04/2020	31/12/2020	8,154	-	-
01/01/2021	31/12/2021	8,665	-	-
01/01/2022	31/12/2022	8,536	-	-

01/01/2023	31/03/2023	1,959	-	-
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SECTION A. DESCRIPTION OF PROJECT

A.1. General description of project

The purpose of this Small-Scale Project Activity (VPA) is the dissemination of improved cooking stoves (ICS) in the neighborhoods of 25 de Junho, Bagamoyo, George Dimitrov, Inhagoia, Inhagoia A, Nsalene, Magoanine A, Malhazine and Zimpeto (south) in Maputo, Mozambique. The Project Activity replaces conventional stoves using charcoal fuel with improved stoves using charcoal fuel.

Stoves disseminated under this VPA are portable devices serving domestic users. The use of improved cookstoves represents a life-transforming agent for the Mozambican community, by means of the implementation of energy-efficient devices that reshape their daily activities into more sustainable practices and promote the environmental awareness within the community and outside it. The basic principle that guarantees an improvement in the cooking practices relies on the fact that the devices concentrate the heat, therefore the amount of charcoal used as fuel is significantly reduced, along with the associated GHG emissions such as CO₂ and other emissions like carbon monoxide and particulate matter derived from the combustion process.

The replacement of traditional stoves by ICS reduces the amount of GHG emitted into the atmosphere. Verified Emission Reductions (VERs) are calculated following the version 10.0 of methodology AMS.II.G. The proposed SSC-VPA is a voluntary action by the CME.

Air pollution from cooking with solid fuel is a key risk factor for childhood pneumonia as well as many other respiratory, cardiovascular and ocular diseases. According to the "Emissions and Performance Test Protocol", with emissions measurements based on the stove testing protocol developed by Colorado State University (available at www.eecl.colostate.edu), the average CO₂ emissions can be reduced by over 60% through the implementation of ICS, compared to a metal stove (charcoal stoves) or three stone fire (wood fuel stoves).

By this means, the improved cookstoves project aims towards mitigating the impacts of climate change with the undertaking of actions such as tackling the depletion of forestry resources and the reduction of GHG emissions related to energy consumption, and moreover it promotes the employment and a better livelihood for the poor, besides access to energy services.

The first batch of ICS was distributed at the beginning of 2016. The project was registered on 13/02/2019 with a first crediting period from 14/02/2017 to 13/02/2024, twice renewable. The last monitoring report was from 01/01/2018 to 31/12/2019. The current is from 30/04/2020 to 31/03/2023, both days inclusive. During the current monitoring period, project activities has reduced 27,314 tCO₂e.

Firewood and charcoal are the main sources of energy for cooking, heating, and illuminating the Mozambican households. 85% of urban households in Mozambique rely on charcoal for meeting energy requirements. This percentage is higher in urban and peri-urban households of Matola and Maputo cities where 87% rely on charcoal for their energy demands. In rural households, almost 98% use wood for energy while 2% use charcoal. Although 67% of the current population resides in rural areas, is not this part of the population that constitutes the major risk for threatening the forest resources, but the remaining 33% of the population that lives in the urban and peri-urban areas, that is still highly dependent depending on firewood and charcoal as the main source of domestic energy. The low-density population and high woody biomass availability in rural areas explain this pattern, while in the urban zones there is prevalence of the opposite case. This, results in a very high pressure on forests adjacent to cities and along roads that are supplying the cities.

The use of improved cookstoves is one of the possible solutions to tackle the challenge that represents managing the loss of forest cover in urban and peri-urban areas and other ecosystems that act as fuel sources for densely populated areas. Although improved stoves are not a novelty in Mozambique, the majority of the people are not aware about the possibilities they offer in terms of reduction of fuel usage. Moreover, there are neither solid technical skills and production capabilities nor access to start up finance for energy business or business skills on marketing efficient cookstoves.

The purpose of the VPA is to reduce the greenhouse gas emission through the replacement of traditional cookstoves by improved cookstoves. The objective is to tackle

major problems related to cooking in Mozambique: deforestation for wood and charcoal production, major incidence of respiratory diseases resulting from indoor air pollution and high expenditure in fuel for cooking.

In general, the project will contribute to the broader Sustainable Development Goals by ensuring environmental sustainability, reducing child mortality rates; contribute to eradicate extreme poverty and hunger by reducing the number of people with income less than 1 USD by establishing a platform for employment.

These objectives will be achieved through the active engagement of all stakeholders including the civil society, the government, the private sector, and the end beneficiaries of the stoves, which are the household members.

A.2. Location of project

Host country is the Republic of Mozambique. The project is located in the neighborhoods 25 de Junho, Bagamoyo, George Dimitrov, Inhagoia, Inhagoia A, Nsalene, Magoanine A, Malhazine and Zimpeto (south) in Maputo, Mozambique. The projects' GPS coordinates are 25°53'19.16"S, 32°33'56.76"E.



A.3. Reference of applied methodology

AMS-II.G v.10.0: Energy efficiency measures in thermal application of non-renewable biomass. Scope 03.

Along with the used Methodology, the following tools are applicable to the project:

Tool 20 - Assessment of de-bundling for small-scale Project activities, version 4.0

Tool 21 - Demonstration of additionality of small-scale project activities, version 12.0

Tool 30 - Calculation of the fraction of non-renewable biomass, version 04.0

A.4. Crediting period of project

The start date is 14/02/2017 and the duration is seven years with the possibility to renew the crediting period twice. The crediting period is 14/02/2017 - 13/02/2024. The crediting period may be renewed twice in line with Community Services Activity Requirements.

SECTION B. IMPLEMENTATION OF PROJECT

B.1. Description of implemented project

The project was registered in the Gold Standard version 2.2 on 13 February 2019 (project ID 6155). The crediting period is 14/02/2017 - 13/02/2024. During this monitoring period, a total number of 12,577 were present in the sales database and 11,319 were found to be operational during the Monitoring Period. The total energy savings per year is calculated as 144.87 GWh and in line with the AMS-II.G methodology where the aggregate energy savings of a single project activity shall not exceed the equivalent of 180 GWh thermal per year in fuel input.

The project previously disseminated three stove brands which are Envirofit Econochar, Envirofit CH2200 and Rocket Works Chazama. In 2019 the Project Developer added one stove produced locally in a semi-industrial way named Mbaula Poupa+. The local production is important because it reduces expenses related to customer duties and other import related expenses, making the stove affordable to the locals while maintaining quality. It also helps to boost the local industry whilst creating employment locally and helping to reduce poverty. Currently, MozCarbon is the leader in improved stove producer in Mozambique.

The stoves are sold door to door to poor households in the project area and users are allowed to pay the stove in up to three installments over a sixty-day period. From this monitoring period onward MozCarbon also work as the distributor of stoves and is responsible for all sales and monitoring operations. It is to be noted that in the first monitoring period (previous), MozCarbon worked with third parties (AVSI) to disseminate stoves on the ground. The summarized technical specifications of the stoves in the project are as follows:

Stove Model	Thermal Efficiency	Manufacturer	Lifespan	Origin
Envirofit CH2200:	33.09%	Envirofit International	5	Imported- Kenya
Envirofit Econochar:	37.23%	Envirofit International	4	Imported – China
Rocketworks ChaZama:	37.7%	Rocket Works Pty	5	Imported – South Africa
MbaulaPoupa+ :	30.5%	MozCarbon	5	Local Production

More detailed characteristics of the stove are available in submitted Water Boiling Test reports previously submitted and enclosed as attachments to this report for quick reference.

B.1.1 Forward Action Requests

FAR from previous verification:

The VVB in charge of the subsequent verification is requested to confirm if the CME has implemented a mechanism in order to:

(1) Prevent the non-identifiable nameplates of the stoves (as a picture of a stove provided has the nameplate burnt and the ID cannot be recognized properly):

- Now the stoves have serial numbers in visible locations and easily identifiable. Since now stoves are being produced by the Project Developer, the serial number is engraved and mechanically pressed for better duration and visibility. It is not painted. This was confirmed by the auditor in the field.

(2) Prevent ICS that can be moved beyond the PoA and/or VPA boundary because the users ceded the device to other persons by buying multiple devices or causing multiple devices can be bought by a single user (as happened in the case of Ms. Eunicia Jaime).

- The PD accepts that only one stove is purchased by end users. Instructions were given to sales agents where in case someone purchases more than one stove to offer to family members or as gift, these are registered with the details of end users and not the person who purchased the stove. In the end, each user has only one stove. Also, the PDD has

a provision in section E.1 where “if 2 project devices are installed per household, 0.5 times the baseline woody biomass consumption per household (Bold,HH) is used as the total annual quantity of woody biomass that would have been used in the absence of the project activity In each device (Bold,I,j)”.

(3) As a result of the sampling exercise, it is noted that approximately 30% of the users are not sure/do not know how to contact CME in case of need for replacement or other concerns. The CME needs to address this situation.

The situation is changed. Since now the CME oversees all the implementation of the project, additional training was performed with stove sales agents (promoters) and end users to better understand how to contact the project developer in case of any grievances or other issues related to stoves and the project. The Carbon Waiver (sales agreement) and leaflets distributed to each end user during sales process have contacts of the project developer. The Monitoring Survey demonstrate that 98%¹ of users are now aware and have knowledge on how to contact the project developer. B.2. Post-Design Certification changes

FARs from Design Change performance review

FAR #1: As the lifetime of the stoves also depends on the maintenance activities performed and the way the stoves have been used/handled during the monitoring periods, which is evident from the lifetime supporting documents submitted. Hence the VVB shall also check the stove condition at the time of verification to conclude whether the stoves have been working within their lifetime.

Response FAR#1: During site visit for verification, the VVB checked the stoves in the households and were confirmed to be operational and well maintained.

¹ Please see the ER calculation spreadsheet, tab “Metrics”, cell D7 for more details on the percentage of users confirming to know how to contact the Project Developer.

FAR #2: The updated estimated Emission Reductions based on this PRC shall be considered for the future monitoring periods/verification.

Response FAR#2: The emission reductions calculations are now updated in the ER calculations sheet to accommodate all the changes in the PRC. It means that in the ER calculations:

- GS approved FNRB of 0.91 was used in the Emission Reductions calculations.
- The decrease of stove efficiency during the lifespan was included in the calculations for each stove. This can be check in the tab "ER Calculations VPA1" of the ER sheet, columns P,Q,R,S,T where biomass savings are calculated for each operational year of the stove by including efficiency loss across the lifespan.
- The leakage calculation is done based on AMS-II G v.10.0 methodology, by multiplying biomass savings by a net to gross adjustment factor of 0.95 to account for leakages, in which case surveys are not required. This is presented in the collum AB of "ER Calculations VPA1" in the ER sheet and factored in the calculation of emission reductions in collum U of the same sheet/tab.

B.2.1. Temporary deviations from the approved Monitoring & Reporting Plan, methodology or standardized baseline

B.2.2. Corrections

N/A

B.2.3. Changes to start date of crediting period

N/A

B.2.4. Permanent changes from the Design Certified monitoring plan, applied methodology or applied standardized baseline

There are no changes to the Monitoring Plan regarding addition or removal of parameters. The below parameters were added in separate tables in the Monitoring Plan. It is to be noted that these parameters are approved in the PDD (section 5.2) but do not appear as parameter tables in the same document as per MR template.

The last version of the registered PDD, in the section "B.5.2 Sustainability Monitoring Plan" shows the parameter considered in the time of first verification ("Chosen

Parameter”) and the “Future Target of the Parameter” for use after the transition to GS4GG. The parameters were monitored according to registered VPA and Transition Annex to GS4GG. The parameters are included in Monitoring tables for more clarity and also because SGG parameters have to be presented in the Monitoring Report.

The parameter “Time spent to collect fuel” in the PDD is not applicable since the project distributes charcoal stoves which fuel is not collected but purchased. It is only applicable where people collect firewood (fuel) to use in wood stoves.

The parameter tables added are:

- Efficiency Loss Factor: is not included in the registered PDD as a separate monitoring parameter (only mentioned that Monitoring Reports/ ex-post calculations will include the detailed determination of the efficiency loss). However, “efficiency loss factors” has been added here in the Monitoring Report as a separate parameter for clarity as it is necessary factor to be accounted in ER calculations. This was approved in previous performance Review.
- Number of people trained during the project implementation (related to SDG#13)
- Percentage of decrease of the household monthly cost to buy fuel for cooking (related to SDG#1)
- Number of staff hired to implement the project activities (related to SDG#1)
- Percentage of the users report the reduction of smoke levels in house (related to SDG#13)

This was approved in previous Performance Review no.2. There is no addition or removal of parameters as explained. However, for more clarity, the explanation is added in this section B.2.4 of the Monitoring Report.

B.2.5. Changes to project design of approved project

In summary, the following changes were granted by the standard:

- Change 1: The leakage calculation shall be done based on AMS-II G v.10.0 methodology, which means that a 5% of the total biomass savings shall be accounted as leakage. As per the methodology AMS-II.G., section 5.4,

paragraph 34, the leakage will be accounted for by multiplying $B_{y,savings,i,j}$ by a 0.95 factor, for which case, surveys are not required.

- Change 2: There were two contradictory statements in relation to the lifespan of the ICS in the registered PoA and VPA-DD. Further, the programme includes several ICS models with different specifications and lifespans. Therefore, the corrected lifespans will be used for individual cookstove types based on manufacturer specifications. Therefore, the following corrected lifespans will be used for individual cookstove types based on manufacturer specifications and experience:
 - EnvirofitEconochar 4 years
 - RocketworksChazama 5 years
 - EnvirofitCH2200 5 years
 - MbaulaPoupa+ 5 years

The summarized stove specifications are detailed in Section B.1 of this Monitoring Report. Detailed technical descriptions and pictures of the stoves implemented in the project are presented in the Water Boiling Test Reports enclosed with this Monitoring Report.

- Change 3: the Fraction of Non Renewable Biomass (FNRB) is indicated in the PoA-DD as a parameter to be monitored. The project developer intend to move this parameter to be fixed ex-ante, taking into account that changes in biomass occur over a relatively long period thus, no need to annually be monitored. In this case, the fNRB value is determined once, thus no monitoring and recalculation of the fNRB value during the crediting period is required.

All the changes were approved by Gold Standard. This is confirmed by the review form with the exchanges between the Project Developer and Gold Standard for three rounds which is shared with the auditor.

SECTION C. DESCRIPTION OF MONITORING SYSTEM APPLIED BY THE PROJECT

A statistically valid stratified sample of the locations where the devices were deployed was used to determine parameter values used to calculate emission reductions and the other SDG impacts, as per the relevant requirements for sampling in the “Standard for sampling and surveys for CDM project activities and programmes of activities version 09.0” and in line with the Sampling Plan developed by the CME, meeting the requirements of AMS II.G V10.0.

During this monitoring period, annual surveys were conducted and thus, in line with the applied CDM methodology and sampling standard a 90 per cent confidence interval and a 10 per cent margin of error shall be achieved for the sampled parameter i.e. for the usage rate of the project stoves. In cases where survey results indicate that 90/10 precision are not achieved, the lower bound of the 90 per cent confidence interval of the parameter value may be chosen as an alternative to repeating the survey efforts to achieve the 90/10 precision.

During this monitoring period, the monitoring survey in the field was conducted between the days 21/02/2023 and 08/03/2023 with a randomly selected sample of 214, end-users and the 90 per cent confidence interval and a 10 per cent margin of error have to be achieved for the sampled parameters. The selection of households to be interviewed was conducted by drawing a sample from the database using the online randomization tools.

As per the para 32 of the applied CDM methodology AMS-II.G and the selected option for the project, a default schedule of linear decrease in efficiency up to the terminal efficiency assumed as 20% per cent is applied through the life span of the project device. Furthermore, the PO maintained a record for the date of commissioning of project devices of each type i and batch j . Please refer the separate selling database for further details.

According to the section 5.3 (para 34) of the applied CDM methodology AMS-II.G. leakage can be accounted for by multiplying $b_{y,savings,i,j}$ by a factor of 0.95 and thus no surveys regarding leakage are required to be made.

Relevant parameters were monitored and recorded during the crediting period as indicated in section B.7.1 of the validated PDD. The applicable requirements specified in the "Standard for sampling and surveys for CDM project activities and programmes of activities version 09.0" and the version 4.0 of the corresponding guideline. are also an integral part of the monitoring guidelines and therefore were followed by the project developer.

MozCarbon, the PO, was responsible for overall monitoring management. The sampling effort, data collection, consolidation and results analysis were undertaken by a team adequately trained, well aware of CDM requirements/Gold Standard Foundation requirements. The human resources dedicated to the monitoring tasks consisted of: (a) A monitoring manager; (b) A data manager; (c) Field supervisors (Monitoring Assistants); (d) Field agents (Surveyors)

Their role description is displayed in the table below.

Role	Description
Monitoring manager	The person responsible for: - Ensuring that all the VPAs and units within each VPA are following the monitoring steps in accordance with the registered monitoring; - Plan as required by the UNFCCC guidelines and approved applied methodologies; - Ensuring that the equipment and measurements in the field are in line with the measurement methods and recording frequency and storing approaches; - Ensuring that all the monitoring data collected from project sites are consolidated and processed digitally in a central database; - Ensuring all monitoring team members received a proper training; - Ensuring that each VPA produces a coherent and standard monitoring report.
Data manager	The person responsible for: - Collecting all data for monitoring;

	- Register data in electronic database and keep hardcopies; - Following up with data calculations and annual monitoring set up.
Fields supervisors	The person responsible for: - Organizing monitoring in the field; - Product identification and maintenance of continuous record of the issued serial numbers along with distribution and commissioning; - Customer training and introduction to O&M during installation and commissioning; - Field agents training; - Collect Legal agreements with end-users and transfer to data manager; - Cross check monitoring information collected by Field agents.
Field agents	The people employed locally working on diverse task for the PoA including monitoring tasks. The person responsible for: - Going in the field and collect raw data from households for monitoring; - Make sign sale agreement to end-users

During this monitoring period, among other trainings, the following two principal training activities were organized: Training for the monitoring staff (surveyors and monitoring assistants) and training for the stove promoters. These are the people in the frontline who assure that stoves are installed and monitored correctly. The below paragraphs summarize the made trainings during the Monitoring Period:

A) Training of Monitoring Personnel:

The last monitoring training was held on 14/02/2023. Number of participants was ten (10). The training was conducted by the head of Monitoring Division of MozCarbon (Mr Moises Antonio). The themes of the training included:

- The importance of evaluating the impact of improved cookstove projects in the households and in general

- The purpose of the Monitoring Survey (Why perform it? What will the data collect help us to understand?)
- Interacting and convincing people to participate in the survey and provide proper feedback. Human Relations and Communications approach.
- Behavior and procedures when interacting with households (respect, compromise, empathy)
- Collecting the data, avoiding errors, cross checking answers, filling the forms.
- Data handling and transference to the Monitoring Assistants for digitalization.
- Using the mobile application Kobo Toolbox: features, data entry and submission.

Large part of the training was dedicated to go through each question of the Survey Questionnaire and discussion of the meaning of the question and how to properly record answers. A practical exercise is also conducted to check if all the surveyors understood all the questions. As part of the surveying exercise, in the end of each day a review is conducted to check the correctness of the collected information.

B) Training of Sales Promoters

The typical participants include the managers of Sales and of Monitoring, Field Office Managers and data manager, the promoters, the sales supervisors, the sales and the monitoring assistants, and the credit collection team.

In general, the themes of the training included:

- Presentation of the problems (economic, social, environmental) associated with current cooking patterns and technologies.
- Presentation of ICS as part of solution to tackle the problems associated with biomass cooking.
- General presentation of carbon credits and role of ICS in emission reductions so that promoters are able explain the issue to the customer and when asking customer's approval to assign carbon rights to the PO.
- Discussions on the benefits of clean cookstoves in economic, social and environmental perspectives.
- Sales techniques and customer follow up. Collection of installment payments from stove users.
- Awareness raising on environmental issues and the importance of clean cooking.

- Stove maintenance.
- The filling of the carbon waivers – contract between project developer and the user where the later passes the carbon rights to the first.
- Data handling and delivery to the office. Care of company equipment – GPSs, receipt books, etc. The use of the GPS equipment.

Additional trainings were conducted with people involved in sales, credit, stove production factory, administration who contributes to the monitoring activities and project implementation. The detailed description of the made trainings is provided in separate training report. At the end of the training, an agreement was signed between the PO and individual promoters to work as distributors of stoves to the households. The agreement included specific provisions on how the selling process was to be performed, including best practice on collecting user and stove data to later be handed to the PO.

Moreover, personnel involved in VPA inclusion, VPA/PoA level monitoring and Project Operator level review and approval had either, alone or collectively as a team, the necessary competence including: (1) Knowledge of the CDM and GS4GG technical and methodological aspects; (2) Skills to apply relevant principles, procedures and techniques for VPA inclusion, verification and review and approval; (3) as a team leader to plan and make effective use of resources, understand the different functions and lead the team to reach conclusion including preparation of the relevant reports and handle all follow up actions.

To ensure the quality and transparency of the collected, in addition to the training activities and capacity building, all documents, lists and questionnaires produced during monitoring were saved under electronic format with physical copies securely stored as evidences under the direct responsibility of the data manager and the supervision of the monitoring manager and should be kept and archived electronically for two years after the end of the crediting period or the last issuance of VERs, whichever occurs later.

During the distribution, each stove promoter assures that necessary data is obtained from the customer that use the ICS. This data includes:

- Stove unique serial ID number (identifies the stove model)
- Name of user or stove beneficiary

- Location of stove (could be determined by a fixed address if applicable, or by using GPS data)
- The phone number of the stove user
- Installation or purchase and contract date
- Users also received orientation from the stove promoter on how to clean and maintain the ICS.

No double counting

The customer data was transferred from each stove promoter to the Project Developer, which manages an electronic database (selling database). Prior to being entered into the Selling Database, all records were screened by the Project Developer together with cross-checks on the stove promoter selling records to confirm that the selling record is authentic and no double counting occurs. The Project Developer is responsible for maintaining such a database covering all VPAs within the PoA. The templates for the records are identical between stove promoters so that comparisons can be carried out easily and duplication becomes easy to detect. Stove promoters' records are screened by the CME to confirm that the installation database is authentic and that no double-counting occurs. Moreover, unique serial number provided to each stove eliminates any risk of double-counting between VPAs.

The Project Developer also checked Carbon standard registries (UNFCCC, Gold Standard, VERRA, etc) and confirm that the current project is not registered as a separate GS project activity, nor included as part of another registered GS (or other carbon standard) PoA nor that the project activity has been deregistered. Further, this is confirmed by a letter signed by the VPA implementer/CME confirming no double counting.

SECTION D. DATA AND PARAMETERS

D.1. Data and parameters fixed ex ante or at renewal of crediting period

SDG#13: Climate Action

Data/parameter	Charcoal use per standard adult/day
Unit	Kg
Description	Where charcoal is used as the fuel by baseline (old) or project (new) devices, the quantity of woody biomass shall be determined by using a default wood to charcoal conversion factor of 6 kg of firewood (wet basis) per kg of charcoal (dry basis). Alternatively, credible local conversion factors determined from a field study or literature may be applied.
Source of data	Refer to: http://www.ipcc-nggip.iges.or.jp/public/gl/guidelin/ch1ref3.pdf The term 'wet basis' assumes that the wood is 'air-dried' as is specified in the IPCC default table
Value(s) applied	Baseline = 0.74 kg; Project = 0.22 kg
Choice of data or Measurement methods and procedures	CDM default value
Purpose of data	Calculation of baseline emissions and calculation of project emissions
Additional comment	-

Data/parameter	$B_{old,p}$
Unit	tonnes/person/year
Description	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 device type i and batch j.
Source of data	KPT Report VPA1
Value(s) applied	2.76
Choice of data or Measurement methods and procedures	Daily consumption of charcoal was taken as 1.26 kg per day per person as per the conducted baseline KPT. This value was then multiplied by the days in a year (365) and by the factor of 6 corresponding to the conversion factor from charcoal to woody biomass: $1.26 \text{ kg/day/pp} * 6 * 365 \text{ days/year} = 2.76 \text{ tonnes/person/year}$.
Purpose of data	Estimation of emission reductions
Additional comment	$B_{old,hh} = B_{old,p} * N_{p,HH} = 2.76 \text{ tonnes/person/year} * 3.74 \text{ persons/hh} = 10.32 \text{ tonnes/hh/year}$

Data/parameter	$N_{p,HH}$
Unit	Number
Description	Average number of persons served per household
Source of data	From KPT Report
Value(s) applied	3.74
Choice of data or Measurement methods and procedures	From baseline data. This data is originated in the KPT for the Chamanculo cookstoves project, also located in Maputo. The KPT data is collected by sampling a significative number of households and consulting with the residents on how many people live in that house.
Purpose of data	Calculation of baseline emissions and calculation of project emissions
Additional comment	-

Data / Parameter	$N_{d,HH}$
Unit	Number
Description	Number of project devices distributed per household
Source of data	Recorded in the ICS distribution database
Value(s) applied	1
Measurement methods and procedures	-
Monitoring frequency	Recorded at the time of commissioning/distribution of project devices
QA/QC procedures	As mentioned in monitoring plan
Purpose of data	Estimation of Emission reductions
Additional comment	-

Data/parameter	$f_{NRB,y}$
Unit	Fraction
Description	Fraction of woody biomass saved by the project activity during year y that can be established as non-renewable biomass
Source of data	Calculated
Value(s) applied	0.91
Choice of data or Measurement methods and procedures	Default CDM values (https://cdm.unfccc.int/DNA/fNRB/index.html) or calculating using UNFCCC TOOL30, version 4.0
Purpose of data	Estimation of emission reductions
Additional comment	

Data/parameter	Leakage adjustment factor
Unit	Fraction
Description	Net to gross adjustment factor to account leakage
Source of data	CDM Methodology default value
Value(s) applied	0.95
Choice of data or Measurement methods and procedures	$B_{y,savings,i,j}$ is multiplied by a net to gross adjustment factor of 0.95 to account for leakages as per the para 5.4 of the CDM methodology AMS-II.G, in which case surveys are not required.
Purpose of data	Estimation of emission reductions
Additional comment	-

D.2 Data and parameters monitored

SDG#13: Climate Action (Emission Reductions)

Data / Parameter	$N_{y,i,j}$												
Unit	Number												
Description	Number of project devices of type i and batch j operating during year y												
Source of data	Measured directly or based on a representative sample. Sampling standard shall be used for determining the sample size to achieve 90/10 confidence precision. A discount shall be applied based on the percentage of devices operational as determined by the sample survey e.g. if survey shows that 10% of the devices is non-operating, an adjustment factor of 0.9 shall be applied to number of project devices commissioned in a particular batch. Separate samples shall be taken for each batch.												
Value(s) applied	<table border="1"> <thead> <tr> <th>Stove Model</th><th>$N_{y,i,j}$</th></tr> </thead> <tbody> <tr> <td>Mbaulta</td><td>5,451</td></tr> <tr> <td>Rocketworks Chazama</td><td>924</td></tr> <tr> <td>Envirofit Econochar</td><td>4,362</td></tr> <tr> <td>Envirofit CH2200</td><td>581</td></tr> <tr> <td>TOTAL</td><td>11,319</td></tr> </tbody> </table>	Stove Model	$N_{y,i,j}$	Mbaulta	5,451	Rocketworks Chazama	924	Envirofit Econochar	4,362	Envirofit CH2200	581	TOTAL	11,319
Stove Model	$N_{y,i,j}$												
Mbaulta	5,451												
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Envirofit Econochar	4,362												
Envirofit CH2200	581												
TOTAL	11,319												

	Details can be found in the ER Calculations sheet, tab "ER Calculations VPA1" cells H12582 to H12586.
Measurement methods and procedures	Measured based on a representative sample, using a questionnaire.
Monitoring frequency	At least once every two years (biennial)
QA/QC procedures	As mentioned in the monitoring plan
Purpose of data	Estimation of Emission Reductions
Additional comment	-

Data / Parameter	μ_y
Unit	Fraction
Description	Adjustment to account for any continued use of pre-project devices during the year y
Source of data	Monitoring
Value(s) applied	0.90
Measurement methods and procedures	Measured based on a representative sample, using a questionnaire.
Monitoring frequency	At least once every two years (biennial)
QA/QC procedures	Transparent data analysis and reporting
Purpose of data	Estimation of Emission Reductions
Additional comment	Calculated as (Number of meals per week cooked with ICS)/(Number of meals cooked with ICS per week + Number of meals cooked with traditional stove per week).

Data / Parameter	$\eta_{\text{new},i,j}$
Unit	Fraction
Description	Efficiency of the device of each type i and batch j implemented as part of the project activity.
Source of data	Monitored (Testing Reports)
Value(s) applied	Envirofit CH2200 33.09% Envirofit Econochar: 37.23% Rocketworks ChaZama: 37.70% Mbaula Poupa+: 30.50%
Measurement methods and procedures	Efficiency shall be measured/estimated as per the following: The efficiency of the project devices shall be based on certification by a national standards body or an appropriate certifying agent recognized by that body. Alternatively, manufacturer specifications on efficiency based on water boiling test (WBT) may be used. The

	sampling test of stoves by such certification bodies/agents or manufacturers shall be conducted following a 90/10 precision in accordance with the "Standard for sampling and surveys for CDM project activities and programme of activities However, the following simplified approach may be used, when the efficient cook-stoves are produced by a manufacturer with a good quality management system in place to ensure that the individual equipment produced do not vary beyond the range of acceptance limits (e.g. characteristics such as materials, critical dimensions): Conduct a sample test on three cook stoves with three tests conducted for each stove; (ii) If the standard deviation of the nine 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
Monitoring frequency	(i) Recorded at the time of commissioning/distribution; (ii) Adjusted for the loss of efficiency as paragraph 25
QA/QC procedures	Transparent data analysis and reporting
Purpose of data	Estimation of Emission Reductions
Additional comment	-

Data / Parameter	Lifespan								
Unit	Number of years								
Description	The operating lifetime of the project device. The operating life time of the project device. The life span should be reported in cases where the PPs are opting to account the efficiency loss as per paragraph 25								
Source of data	Manufacturer's specifications								
Value(s) applied	<table> <tr> <td>Envirofit Econochar</td><td>4 years</td></tr> <tr> <td>Rocket Works Chazama</td><td>5 years</td></tr> <tr> <td>Envirofit CH2200</td><td>5 years</td></tr> <tr> <td>Mbaula Poupa+</td><td>5 years</td></tr> </table>	Envirofit Econochar	4 years	Rocket Works Chazama	5 years	Envirofit CH2200	5 years	Mbaula Poupa+	5 years
Envirofit Econochar	4 years								
Rocket Works Chazama	5 years								
Envirofit CH2200	5 years								
Mbaula Poupa+	5 years								
Measurement methods and procedures	This value is the average lifespan of the four different devices used in the project.								
Monitoring frequency	Fixed and recorded at the time of commissioning/distribution								
QA/QC procedures	-								
Purpose of data	Estimation of emission reductions								

Additional comment	The lifespan should be reported in cases where the PPs are opting to account the efficiency loss as per paragraph 25 of the CDM methodology AMS-IIG.
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Data / Parameter	NCV _{biomass}
Unit	TJ/tonne
Description	Net calorific value of the non-renewable woody biomass, briquettes or charcoal used in project devices.
Source of data	CDM methodology default value / IPCC default
Value(s) applied	0.0156 ²
Measurement methods and procedures	IPCC default for wood fuel, 0.0156 TJ/tonne
Monitoring frequency	Yearly
QA/QC procedures	-
Purpose of data	Estimation of emission reductions
Additional comment	The eventual new IPCC default values will be monitored at the IPCC web-pages annually.

Data / Parameter	$\eta_{old,i,j}$
Unit	%
Description	Efficiency of pre-project device
Source of data	Baseline Water Boiling Test Report
Value(s) applied	21.28
Measurement methods and procedures	A prior project start baseline survey was implemented in the field in line with the options of the applied CDM methodology to define the weighted average efficiency of the pre-project devices . Baseline stoves are conventional devices with no improved combustion air supply or flue gas ventilation. A weighted average values (taking the amount of woody biomass consumed by each device as the weighting factor) is calculated as more than one type

² 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 also woody biomass. If fuel used in the project device is charcoal, **0.029** TJ/tonne may be used. If briquette is used as project fuel, NCV shall be measured annually

	of device is being replaced. Please refer to the Water Boiling Test for details.
Monitoring frequency	Fixed for each individual household when included in the project activity database
QA/QC procedures	-
Purpose of data	Estimation of emission reductions
Additional comment	-

Data / Parameter	Date of commissioning of batch j
Unit	Date
Description	Actual date of commissioning of the latest device within the batch
Source of data	Internal records
Value(s) applied	01/01/2016 – 31/03/2023, Please refer the ER Spreadsheet tab “Stove Distribution”
Measurement methods and procedures	To establish the date of commissioning, the Project Participant may opt to group the devices in “batches” and the latest date of commissioning of a device within the batch shall be used as the date of commissioning for the entire batch
Monitoring frequency	Fixed and recorded at the time of commissioning/distribution of the last project device in the batch
QA/QC procedures	-
Purpose of data	Estimation of emission reductions
Additional comment	This approach is not foreseen to be applied within this VPA. In case this approach is used, it will be reported in the relevant monitoring report.

Data / Parameter	Date of commissioning of device i
Unit	Date
Description	Actual date of commissioning of the project device
Source of data	Internal records
Value(s) applied	01/01/2016 – 31/03/2023, Please refer the ER Spreadsheet tab “Sales Database”
Measurement methods and procedures	-
Monitoring frequency	Fixed and recorded at the time of commissioning/distribution

QA/QC procedures	-
Purpose of data	Estimation of emission reductions
Additional comment	To be reported in the monitoring report

Data / Parameter	Efficiency loss factor ³
Unit	Fraction
Description	Adjustment factor to account the loss in efficiency of the project devices i in each batch j due to aging during the monitoring period
Source of data	CDM methodology default value
Value(s) applied	Envirofit CH2200 2.62% Envirofit Econochar: 4.31% Rocketworks ChaZama: 3.54% Mbaula Poupa+: 2.10%
Measurement methods and procedures	In line with the para 32 of the applied CDM methodology AMS-II.G a default schedule of linear decrease in efficiency up to the terminal efficiency assumed as 20 per cent shall be applied through the life span of the project device . For example, if the life span of project device is five years and project device has an efficiency of 30 per cent at commissioning then a 2 per cent decrease in efficiency every year shall be applied.
Monitoring frequency	Fixed and recorded at the time of commissioning/distribution
QA/QC procedures	-
Purpose of data	Estimation of emission reductions
Additional comment	Please refer the cell AV4, AV5, AV6 and AV7 within the ER spreadsheet, tab "ER Calculations VPA1". The efficiency loss is factored in the calculations. Please refer to the same spreadsheet mentioned here.

³ Please note that "efficiency loss factors" is not included in the registered PoA-DD as a separate monitoring parameter (only mentioned that Monitoring Reports/ ex-post calculations will include the detailed determination of the efficiency loss). However, "efficiency loss factors" has been added here in the Monitoring Report as a separate parameter for clarity as it is necessary factor to be accounted in ER calculations. Please refer the cell AV4, AV5, AV6 and AV7 within the ER spreadsheet, tab "ER Calculations VPA1". The efficiency loss is factored in the calculations. Please refer to the same spreadsheet mentioned here.

SDG#13: Climate Action

Data / Parameter	Number of people trained during the project implementation ⁴
Unit	Number of persons
Description	Number of personnel attending training sessions for
Source of data	Monitoring
Value(s) applied	264
Measurement methods and procedures	The number of persons attending training sessions is recorded on a continual basis as and when trainings occur. The names of all attendees will be recorded and filed for reporting during annual monitoring.
Monitoring frequency	Annual
QA/QC procedures	-
Purpose of data	Determining Sustainability Indicator no 6: "Technology transfer and technological self-reliance"
Additional comment	Within the Sustainability Monitoring Plan of the registered PoA-DD relevant indicator is the Sustainability Indicator no 6: "Technology transfer and technological self-reliance". <u>Current situation of the parameter:</u> Training is carry out every time a new project staff join the project team or during ICS capacitation assemble. <u>Estimation of the baseline situation of the parameter:</u> Prior to the project the households had no or limited access to clean cookstoves and had limited or no knowledge of this technology. <u>Future target for the parameter:</u> Number of people trained during the project implementation.

⁴ This parameter is related to SDG#13 on the Sustainability indicator 6 of the VPA-DD section B.5.2: "Technology transfer and technological self-reliance" and it was approved by GS in other projects under the PoA GS5562. It is also related to target 13.3 "Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning". This was approved in previous performance review of this project and in other projects under the same PoA.

SDG#1: No Poverty

Data / Parameter	Percentage of decrease of the household monthly cost to buy fuel for cooking.
Unit	%
Description	Share of users that perceive a reduced charcoal consumption that result in financial savings related to ICS usage
Source of data	Socio-economic survey conducted during ICS monitoring visits. Data collected through monitoring survey. People are asked about amount of charcoal consumed when using the ICS compared to the baseline stoves.
Value(s) applied	95.80%
Measurement methods and procedures	People were asked if "Since you started use the improved stove, the amount of charcoal used": (The answers possible were a) increased, b) decreased, c) Same, d) Don't Know)
Monitoring frequency	Annually
QA/QC procedures	-
Purpose of data	To determine what is the user perception of the savings related to fuel consumption in order to determine impacts of the project in the financial status of the local population.
Additional comment	The financial savings in fuel represent an opportunity to improve the financial status, representing a measure of poverty mitigation.

SDG#1: No Poverty

Data / Parameter	Number of staff hired to implement the project activities
Unit	Number
Description	The project proponent must provide the staff with the contracts, Social Security System, which includes health, pensions and labor risks.
Source of data	Monitoring

Value(s) applied	184 ⁵
Measurement methods and procedures	Contracts, documents as proof of social security payments and health insurance ⁶
Monitoring frequency	Annually
QA/QC procedures	-
Purpose of data	Determining Sustainability Indicator "Quantitative employment and income generation"
Additional comment	-

SDG #3: Good Health and Well Being

Data / Parameter	Percentage of the users report the reduction of smoke levels in house.
Unit	Percentage (%)
Description	User perception of the reduction of the amount of smoke inside the house when using an ICS, as opposed of using a traditional cookstove.
Source of data	Socio-economic survey conducted during ICS monitoring visits. Data collected through monitoring survey. People are asked about the amount of smoke inside the house when using the ICS compared to the baseline stoves.
Value(s) applied	93.90%
Measurement methods and procedures	Contracts, documents as proof of social security payments and health insurance ⁷
Monitoring frequency	Annually
QA/QC procedures	-

⁵ Head office support (23), Sales promoters (131), Stove Production factory (30)

⁶ The Project Developer pays social security (INSS) for all employees. The social security provide all personnel with cover for different situations such as medical treatment, Hospitalization, labour risks and accidents, pension, maternity cover, funeral coverage among other benefits. The documents confirming this assertion are attached as proof and were also previously shared with the DOE

⁷ The Project Developer pays social security (INSS) for all employees. The social security provide all personnel with cover for different situations such as medical treatment, Hospitalization, labour risks and accidents, pension, maternity cover, funeral coverage among other benefits. The documents confirming this assertion are attached as proof and were also previously shared with the DOE

Purpose of data	To assess the impact of in-house air contamination resulting from the use of the ICS.
Additional comment	The SDG mortality rate indicators are indirectly derived from this information, as mortality rates are intimately related to in-house air quality. If the air quality improves, the mortalities rates drop

D.3. Comparison of monitored parameters with last monitoring period

Data/Parameter	Value obtained in this monitoring period	Value obtained last monitoring period
SDG #1 No Poverty	95.80%	93.90%
SDG #1 No Poverty	184	115
SDG #3 Good health and wellbeing	93.90%	90.60%
SDG #13 Emission Reductions	27,314	46,597
SDG #13	264	154

D.4. Implementation of sampling plan

A statistically valid sample of end-user households has been selected to conduct the surveys and determine number of project devices in operation and the adjustment factor to account for any continued use of pre-project devices. Since inspection is conducted annually, a 90 per cent confidence interval and a 10 per cent margin of error have to be achieved for the sampled parameters. The "Standard for sampling and surveys for CDM project activities and programmes of activities version 09.0" has been applied and the following precisions have been achieved:

Table 2: Required minimum Sample size (Simple Random Sampling)⁸

Sample Size Determination for a Proportion Parameter	confidence/precision criterion
Survey design: Simple random sampling	90/10
Calculation method: Precision via confidence interval	

Instruction for using this calculator	
Input information in cells coloured in orange	
Outputs are displayed in cells coloured in green	

Input	Value	Notes
Expected proportion, p	0.80	enter on a decimal scale
Confidence level	90%	e.g. for 90% enter 90
z multiplier	1.645	determined by confidence level
Relative precision	10%	e.g. for 10% enter 10
Population size, N	12,577	
Predicted sample size, n	68	rounded up to nearest integer

Table 3: Achieved Relative Sampling Precision for parameter Percentage of the user report the Reduction of smoke levels in house (SDG#3)

Calculator to check if the precision has been met or not after a sampling survey is conducted

Input	Value	Notes
Actual sample size	214	
Sample proportion	0.9390	
Standard error of the proportion	0.0163	
Precision associated with a proportion	0.0268	
Relative precision	2.9%	

⁸ Please also refer to GS10711_Meth_guid48Calculator sheet "SRS – Proportion"

Table 4: Achieved Relative Sampling Precision for parameter "Percentage of decrease of the household monthly cost to buy fuel for cooking" (SDG#1)

Input	Value	Notes
Actual sample size	214	
Sample proportion	0.9530	
Standard error of the proportion	0.0144	
Precision associated with a proportion	0.0237	
Relative precision	2.5%	

As per the tables above it can be noted that the project developer conducted the Monitoring Surveys in more than required households as per the minimum sample size calculation. Moreover, it can be noted that the requested confidence/precision was achieved.

Field Surveys

Field surveys were performed by trained personnel working for the project developer. Households to be surveyed were selected using online randomization applications using the stove distribution database to select households to assure that the households selected were not biased. Monitoring assistants and supervisors were responsible to supervise field activities and checking completeness and quality of data. Assistants were also responsible on following up with interviewed households to check the presence of the surveyor and to confirm survey information. The field surveys were conducted randomly, observing the respective proportions for each ICS model, using the questionnaire in Annex 1, in Portuguese. The resulting information was organized in a digital database, from where it was processed statistically.

SECTION E. CALCULATION OF SDG IMPACTS

E.1. Calculation of baseline value or estimation of baseline situation of each SDG Impact

SDG#13: Climate Action

The methodology directly provides equation for emission reductions; without separate baseline, project or leakage emission reduction equations. Calculation of Emission Reductions with actual values by application of Gross to Net Leakage adjustment factor of 0.95 to baseline emissions is demonstrated in section E.2.

SDG#13: Climate Action

Number of people trained during the project implementation = 0

The parameter of SDG#13 (Number of people trained during the project implementation) is related to the Sustainability indicator #6 (Technology transfer and technological self-reliance") in VPA-DD and was approved during transition to GS4GG. It is also related to target 13.3 "Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning".

SDG#1: No Poverty

Percentage of decrease of the household monthly cost to buy fuel for cooking = 0%

The approach for determining the SDG 1 impacts considers the share of cookstove end-users that perceive a reduced charcoal consumption that result in financial savings related to ICS usage. This will be studied through specific questions included in the ICS monitoring survey i.e. people are asked about amount of charcoal consumed when using the ICS compared to the baseline stoves. Moreover, the number of staff hired to implement the project activities will be monitored. Each hired staff member will have a signed contract, Social Security System, which includes health, pensions, and labour risks. The monitoring of the same will be done through the contracts and documents which proof social security payments and health insurance.

SDG#1: No Poverty:

Number of staff hired to implement the project activities = 0

The project impacts will be monitored through describing the working conditions in line with the Sustainability Indicator no 5 "Quantitative employment and income generation". For this sustainability indicator no specific calculation methods are applied but a determination is made following the indications of the Sustainability Monitoring Plan of the PoA-DD i.e. via monitoring the number persons hired for implementing project activities and having working contracts with the social security system and via monitoring the number of personnel trained for sale and monitoring activities. These results will be proofed with the work contracts made with the hired staff.

SDG#3: Good Health and Wellbeing

Percentage of the users report the reduction of smoke levels in house = 0%⁹

The approach to estimate the outcome associated to SDG#3 considers the share of cookstove end-users that perceive a reduced smoke levels in house related to ICS usage. This will be studied through specific questions included in the ICS monitoring survey i.e. people are asked about the amount of smoke inside the house when using the ICS compared to the baseline stoves.

The above described approach is in line with Sustainability Indicator no 1 "Air quality" of the registered PoA-DD which is studied through asking a random sample of project households to evaluate the perceived reduction in presence of the in-house smoke, respiratory diseases and itchy eyes by giving the following four possible answer options: decreased; same amount as pre-project; increased; and "I don't know").

⁹ According to Section B.5.2 of approved PDD, the baseline situation of the parameter is "Possible health impact for traditional cookstoves users due to the presence of smoke inside the house."

Approaches regarding the monitoring of the Sustainable Indicators of the Sustainable Monitoring Plan included within the PoA-DD

In addition to the above described choices/approaches for estimating the SDG outcome, the project impacts will be monitored using the following approached in line with the Sustainability Monitoring Plan of the registered PoA-DD:

1) Sustainability Indicator no 1: "Air quality"

<u>No</u>		<u>1</u>
<u>Indicator</u>		<u>Air quality</u>
<u>Mitigation measure</u>		<u>Not relevant</u>
<u>Repeat for each parameter</u>		<u>Verification period</u>
<u>Chosen parameter</u>		<u>Change in presence of smoke and impacts on health and well- being.</u>
<u>Current situation of parameter</u>		<u>Households with traditional stoves report high smoke levels and possible incidence of respiratory illness.</u>
<u>Estimation of baseline situation of parameter</u>		<u>Possible health impact for traditional cookstoves users due to the presence of smoke inside the house.</u>
<u>Future target for parameter</u>		<u>Percentage of the users report the reduction of smoke levels in house.</u>
<u>Way of monitoring</u>	<u>How</u>	<u>Surveys on a sample group of stove users asking for the perceived change in presence of smoke and impacts on health and well- being.</u>
	<u>When</u>	<u>Annually</u>
	<u>By who</u>	<u>Monitoring agents of each VPA</u>

<u>No</u>		<u>6</u>
<u>Indicator</u>		<u>Technology transfer and technological self-reliance</u>
<u>Mitigation measure</u>		<u>Not relevant</u>
<u>Repeat for each parameter</u>		<u>Verification period</u>
<u>Chosen parameter</u>		<u>Number of people trained to promote the ICS and for monitoring purposes.</u>
<u>Current situation of parameter</u>		<u>Training is carry out every time a new project staff join the project team or during ICS capacitation assemble.</u>
<u>Estimation of baseline situation of parameter</u>		<u>Prior to the project the households had no or limited access to clean cookstoves, and had limited or no knowledge of this technology.</u>
<u>Future target for parameter</u>		<u>Number of people trained during the project implementation.</u>
<u>Way of monitoring</u>	<u>How</u>	<u>The number of persons attending training sessions are recorded on a continual basis as and when trainings occur. The names of all attendees</u>

		<u>will be recorded and filed for reporting during annual monitoring.</u>
	<u>When</u>	<u>Annually</u>
	<u>By who</u>	<u>Project team</u>

2) Sustainability Indicator no 2: "Quality of employment/Description of working conditions"

<u>No</u>		<u>2</u>
<u>Indicator</u>		<u>Quality of employment</u>
<u>Mitigation measure</u>		<u>Not relevant</u>
<u>Repeat for each parameter</u>		<u>Verification period</u>
<u>Chosen parameter</u>		<u>Description of working conditions:</u> - <u>Training of the staff involved with the project activities. The staff are trained for the distribution and to monitor the improved cookstoves. The training is carried out by MozCarbon. The project proponent must provide the staff with the Social Security System, which includes health, pensions and labour risks.</u>
<u>Current situation of parameter</u>		<u>Staff working in the VPA 1 has been contracted under contract for services rendered or working cooperatives.</u>
<u>Estimation of baseline situation of parameter</u>		<u>Deficit in skilled labour for the project activity and precarious employment conditions. Workers are not registered or organized.</u>
<u>Future target for parameter</u>		<u>Training of project staff. Percentage of the workers organized in cooperatives or registered as service providers, according to the professional activity.</u>
<u>Way of monitoring</u>	<u>How</u>	<u>Attendee lists for training and capacity building for project staff carry out by the project proponent for each VPA.</u> <u>Documents that prove the affiliation to the Social Security System. Contracts and professional registry documentation copies.</u>
	<u>When</u>	<u>Annually</u>
	<u>By who</u>	<u>Monitoring agents of each VPA</u>

3) Sustainability Indicator no 3: "Livelihood of the poor/Money spent to buy fuel"¹⁰

<u>No</u>		<u>3</u>
<u>Indicator</u>		<u>Livelihood of the poor</u>
<u>Mitigation measure</u>		<u>Not relevant</u>
<u>Repeat for each parameter</u>		<u>Verification period</u>
<u>Chosen parameter</u>		<u>Money spent to buy fuel for cooking.</u> <u>Time spent to collect fuel.</u>
<u>Current situation of parameter</u>		<u>Households have a fix cost going toward fuel for cooking. Also, families that collect their wood fuel spend a lot of time per month on this activity and have to travel considerable distances to obtain it.</u>
<u>Estimation of baseline situation of parameter</u>		<u>Currently, households spend more money buying fuel due to higher fuel consumption using the traditional cookstoves.</u> <u>Therefore, savings from purchasing less fuel could be used for income-producing activities, education or other activities.</u>
<u>Future target for parameter</u>		<u>Percentage of decrease of the household monthly cost to buy fuel for cooking.</u>
<u>Way of monitoring</u>	<u>How</u>	<u>Reduction of fuel consumption with the improved cookstove, according to the Kitchen Performance Tests. This will be combined with surveys to clean cookstoves users asking for the perceived change in the cost and time spent cooking.</u> <u>Surveys will assess the reduction of the use of non-renewable energy.</u>
	<u>When</u>	<u>Annually</u>
	<u>By who</u>	<u>Monitoring agents of each VPA</u>

4) Sustainability Indicator no 4: "Access to affordable and clean energy"

No	4
Indicator	Access to affordable and clean energy
Mitigation measure	Not relevant
Repeat for each parameter	Verification period
Chosen parameter	Number of Beneficiaries using exclusively the project stove.
Current situation of parameter	Access to improved cookstoves through the efforts of the project proponent of each VPA
Estimation of baseline situation of parameter	Use of less efficient cookstoves
Future target for parameter	Percentage of the increase the use of improved cookstoves.

¹⁰ Please note that time spent to collect fuel is not monitored as not relevant for this VPA as the used cooking fuel (charcoal) is purchased, not collected.

<u>Way of monitoring</u>	<u>How</u>	<u>Unexpected surveys according to a random sampling. The agents will be checking if the baseline technology is still in use after the introduction of the improved technology or whether a new baseline technology is acquired and put to use by targeted end users during the project crediting period.</u>
	<u>When</u>	<u>Annually</u>
	<u>By who</u>	<u>Monitoring agents of each VPA</u>

5) Sustainability Indicator no 5: "Quantitative employment and income generation"

<u>No.</u>		<u>5</u>
<u>Indicator</u>		<u>Quantitative employment and income generation</u>
<u>Mitigation measure</u>		<u>Not relevant</u>
<u>Repeat for each parameter</u>		<u>Verification period</u>
<u>Chosen parameter</u>		<u>Number and types of jobs created.</u>
<u>Current situation of parameter</u>		<u>New staff hired specifically for the implementation of the project activity.</u>
<u>Estimation of baseline situation of parameter</u>		<u>Project proponent of each VPA without staff related to the project activities</u>
<u>Future target for parameter</u>		<u>Number of staff hired to implement the project activities.</u>
<u>Way of monitoring</u>	<u>How</u>	<u>Contracts</u>
	<u>When</u>	<u>Annually</u>
	<u>By who</u>	<u>Monitoring agents of each VPA</u>

6) Sustainability Indicator no 6: "Technology transfer and technological self-reliance"

<u>No.</u>		<u>6</u>
<u>Indicator</u>		<u>Technology transfer and technological self-reliance</u>
<u>Mitigation measure</u>		<u>Not relevant</u>
<u>Repeat for each parameter</u>		<u>Verification period</u>
<u>Chosen parameter</u>		<u>Number of people trained to promote the ICS and for monitoring purposes.</u>
<u>Current situation of parameter</u>		<u>Training is carry out every time a new project staff join the project team or during ICS capacitation assemble.</u>
<u>Estimation of baseline situation of parameter</u>		<u>Prior to the project the households had no or limited access to clean cookstoves, and had limited or no knowledge of this technology.</u>
<u>Future target for parameter</u>		<u>Number of people trained during the project implementation.</u>
<u>Way of monitoring</u>	<u>How</u>	<u>The number of persons attending training sessions are recorded on a continual basis as and when trainings occur. The names of all attendees will be recorded and filed for reporting during annual monitoring.</u>
	<u>When</u>	<u>Annually</u>
	<u>By who</u>	<u>Project team</u>

E.2. Calculation of project value or estimation of project situation of each SDG Impact

>> SDG#13: Emission Reductions¹¹

$$ER_{y,i,j} = B_{y,savings,i,j} \times N_{y,i,j} \times \mu_y \times f_{NRB,y} \times NCV_{biomass} \times EF_{projected_fossil\ fuel}^{12} = 27,314 \text{ tonCO}_2\text{e}$$

Where:

$B_{y,savings,i,j}$	=	Quantity of woody biomass that is saved in tonnes per cook stove device of type i and batch j during year y
$f_{NRB,y}$	=	Fraction of woody biomass that can be established as non-renewable biomass using survey methods or government data or default country specific fraction of non-renewable woody biomass (fNRB) values available on the CDM website ¹³
$NCV_{biomass}$	=	Net calorific value of the non-renewable woody biomass that is substituted (IPCC default for wood fuel, 0.015 TJ/tonne, based on the gross weight of the wood that is 'air-dried')
$EF_{projected_fossilfuel}$	=	Emission factor for the fossil fuels projected to be used for substitution of non-renewable woody biomass by similar consumers. Use a value of 63.7 t CO ₂ /TJ
$N_{y,i,j}$	=	Number of project devices of type i and batch j operating during year y
μ_y	=	Adjustment to account for any continued use of pre-project devices during the year y when applying equations 6 and 8 (fraction). Use 1.0 in other cases

$B_{y,savings,i,j}$ is estimated as follows (i.e. using the "Option 3" in the page 8 of the applied methodology):

¹¹Sample calculations may not reflect actual values achieved. This is because many factors are considered in the sample calculations which cannot be satisfactorily replicated in the word format Monitoring Reports. Such factors include: multiple years, different stove models, lifespan, days in operation, efficiency loss across the lifespan, etc. These details can only be accounted in excel. More details on the formulas and calculations, including the Pro-Rata Emission Reduction Calculations will be found in the ER Calculation spreadsheet with name "GS6155 Ex Post ER Calculations MP3 FINAL" tab "ER calculations_VPA1". Also, values applied will be found in the referred spreadsheet.

¹²In the calculation 0.95 was introduced in the calculation to account for 5% considered as leakage.

¹³ FNRB calculated as per Tool 30 version 4.0

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

Below are sample calculations of emission reductions. These calculations do not reflect actual values achieved but the process of calculation. This is because many factors are considered in the calculations which cannot be satisfactorily replicated in this word format Monitoring Reports. Such factors include: multiple years, different stove models, different lifespan, different number of days in operation for each stove, efficiency loss across the lifespan, etc.

Envirofit CH2200

$$ER_{y,i,j} = 3.68 \times 646 \times 0.90 \times 0.91 \times 0.0156 \times 63.7 \times 0.95 = 1,838$$

Envirofit Econochar

$$ER_{y,i,j} = 4.42 \times 4,847 \times 0.90 \times 0.91 \times 0.0156 \times 63.7 \times 0.95 = 16,546$$

Rocket Works Chazama

$$ER_{y,i,j} = 4.49 \times 1,027 \times 0.90 \times 0.91 \times 0.0156 \times 63.7 \times 0.95 = 3,565$$

Mbaulta Poupa+

$$ER_{y,i,j} = 3.12 \times 6,057 \times 0.90 \times 0.91 \times 0.0156 \times 63.7 \times 0.95 = 14,611$$

The actual values achieved considering pro-rata calculations and all the factor indicated above are in the table below. More details on the formulas and calculations, including the Pro-Rata Emission Reduction Calculations will be found in the ER Calculation spreadsheet with name "GS6155 Ex Post ER Calculations MP3 FINAL" tab "ER calculations_VPA1". Also, values applied will be found in the referred spreadsheet.

Vintage Year	Dates	SDG 13 (tCO ₂ e)
2020	30/04/2020-31/12/2020	8,154
2021	01/01/2021-31/12/2021	8,665
2022	01/01/2022-31/12/2022	8,536
2023	01/01/2023-31/03/2023	1,959

	TOTAL	27,314
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The emission reductions were calculated Pro-Rata based on the number of stoves of each type operational per day during the Monitoring Period. Also, the factor to account efficiency loss across the lifespan was included in the calculations.

Total Emission Reductions (Pro-Rata) = 27,314 tCO₂e as per the ER Spreadsheet cell AK3 in the tab "ER calculations_VPA1".

SDG#13: Number of people trained during the project implementation = 264¹⁴

Vintage Year	Dates	SDG#1: No Poverty: Number of people trained during the project implementation
2020	30/04/2020-31/12/2020	18
2021	01/01/2021-31/12/2021	40
2022	01/01/2022-31/12/2022	126
2023	01/01/2023-31/03/2023	80
	TOTAL	264

SDG#1: No Poverty: Percentage of decrease of the household monthly cost to buy fuel for cooking = 95.8%¹⁵

Number of people perceiving decrease of the household monthly cost to buy fuel for cooking/Total number of respondents in the survey*100% = 205/214*100 = 95.8%

¹⁴Training attendance sheets are provided to prove the achievement of this SDG

¹⁵ Based on sample responses from Monitoring Surveys as per the Monitoring Plan

Vintage Year	Dates	SDG#1: No Poverty: Percentage of decrease of the household monthly cost to buy fuel for cooking
2020	30/04/2020-31/12/2020	95.80%
2021	01/01/2021-31/12/2021	95.80%
2022	01/01/2022-31/12/2022	95.80%
2023	01/01/2023-31/03/2023	95.80%
	TOTAL	95.80%

SDG#1: No Poverty: Number of staff hired to implement the project activities = 184¹⁶

Vintage Year	Dates	SDG#1: No Poverty: Number of staff hired to implement the project activities
2020	30/04/2020-31/12/2020	23
2021	01/01/2021-31/12/2021	44
2022	01/01/2022-31/12/2022	102
2023	01/01/2023-31/03/2023	15
	TOTAL	184

¹⁶ Sample contracts and other employment information available as evidence for the achievement of this SDG

SDG#3: Good Health and Wellbeing

Percentage of the users report the reduction of smoke levels in house = 93.9%

Number of people report the reduction of smoke levels in house/ Total number of respondents in the survey*100% = 201/205*100% = 93.9%

Vintage Year	Dates	SDG#3: Good Health and Wellbeing: Percentage of the users report the reduction of smoke levels in house
2020	30/04/2020-31/12/2020	93.90%
2021	01/01/2021-31/12/2021	93.90%
2022	01/01/2022-31/12/2022	93.90%
2023	01/01/2023-31/03/2023	93.90%
	TOTAL	93.90%

E.3. Calculation of leakage

The methodology AMS-II.G, version 10.0 directly provides equation for emission reductions, without separate baseline, project or leakage emission reduction equations. As per the methodology AMS-II.G., section 5.4, paragraph 34, the leakage is accounted for by multiplying $b_{y,savings,i,j}$ by a 0.95 (net to gross adjustment factor), for which case, surveys are not required. The leakage emissions are factored in the calculation of emission reductions and can be seen in the formula on ER calculations spreadsheet¹⁷.

Below is the summary of leakage emission values. Transparent leakage emissions calculation per vintage year and the total for Monitoring Period are present in Emission Reductions calculation worksheet, tab "ER calculations VPA1", cells AK16 to AK20.

¹⁷ The formula for calculation of Emission Reductions in collum U of the tab "ER calculations_VPA1" also factor the leakage adjustment factor which is in collum AB of the same sheet..

Vintage Year	Dates	Leakage Emissions (ton CO2e)
2020	30/04/2020-31/12/2020	408
2021	01/01/2021-31/12/2021	433
2022	01/01/2022-31/12/2022	427
2023	01/01/2023-31/03/2023	98
	TOTAL	1,366

E.4. Calculation of net benefits or direct calculation for each SDG Impact

SDG	SDG Impact	Baseline estimate	Project estimate	Net benefit
13	Emission Reductions	0	27,314	27,314 ¹⁸
13	Number of people trained During project implementation	0	264	264
1	Percentage of decrease of the Household monthly cost to buy fuel	0	95.8%	95.8%
1	Number of staff hired to implement Project activities.	0	184	184
3	Percentage of the user report the Reduction of smoke levels in house	0	93.9%	93.9%

¹⁸ Is to be noted that leakage value was also subtracted in the calculation..

E.5. Comparison of actual SDG Impacts with estimates in approved PDD

SDG	Values estimated in ex ante calculation of approved PDD for this monitoring period	Actual values ¹⁹ achieved during this monitoring period
1	94.3%	95.8%
1	0	184
3	92.7%	93.9%
13	71,786 ²⁰	27,314
13	8	264

E.5.1. Explanation of calculation of value estimated ex ante calculation of approved PDD for this monitoring period.

>>

SDG#13: Emission Reductions: ERs were calculated as per the AMS-II.G v.10.0: Energy efficiency measures in thermal application of non-renewable biomass. The excel sheet is attached with all calculations.

SDG#13: Number of people trained during the project implementation: taking into account the project structure and number of people to be hired to implement project activities, it was estimated that at least 8 would undergo training during the project implementation and monitoring period.

¹⁹ Whenever emission reductions are capped, both the original and capped values used for calculations must be transparently reported. Use brackets to denote original values.

²⁰ Annual Average as per the Ex-Ante spreadsheet and the Project Design Document (VPA-DD) is 24,595 tCO₂e per year (see registered VPA-DD), which is extrapolated to the duration of this reporting period to cover the entire Monitoring period. Years where the PDD estimated annual value was extrapolated are 2020 and 2023. Details of the extrapolation can be located in cells B10 and B13, tab "SDG summary_VPA 1" of the ER calculations spreadsheet.

SDG#1: Number of staff hired to implement the project activities: In the absence of the project zero (0) people would have access to employment opportunities.

SDG 1: Percentage of decrease of the household monthly cost to buy fuel for cooking: Based on previous experiences, it was estimated that at least 94.3% of households would perceive reduction in monthly charcoal expenditure using the project stove in comparison with the traditional stove.

SDG#3: Percentage of the users report the reduction of smoke levels in house: the estimation is based on previous experience and it is expected that at least 92.7% of households would report smoke reduction in the kitchen in comparison to using the traditional stove.

E.6. Remarks on increase in achieved SDG Impacts from estimated value in approved PDD

The achieved SDGs 13 - Emission Reductions in the monitoring period are lower in comparison with the values estimated in the PDD. This situation is conservative and is a result of the following reasons: (1) During the Monitoring period, stoves distributed in previous years reached the end of their lifespan and the ERs were not considered or in some cases these stoves generated ERs in only part of the duration of the Monitoring Period; (2) The emission reductions are calculated Pro-rata based on the number of days operational in Monitoring period whilst in the PDD stoves are considered to be working the entire year.. The Pro-rata calculations (Emission Reductions) for the monitoring period are presented in the Emission Reductions spreadsheet. Actual number of days each stove was used is detailed in the same document in the tab "ER calculations_VPA1". Using the pro-rata calculations, the actual value achieved and claimed by the project is 27,314 whilst, based on PDD values and extrapolated for this Monitoring period we have a value of 71,786 tCO₂e.

The Number of staff hired to implement the project activities (related to SDG#1) and the Number of people trained during the project implementation (related to SDG#13) increased significantly because now the Project Developer is now at the same time the CME and it is responsible for implementing all activities whilst in the beginning all activities were implemented by third party entity. The other SDGs do not have noticeable differences when comparing with PDD estimations.

SECTION F. SAFEGUARDS REPORTING

Below is the safeguarding principles assessment as per the Safeguarding Principles and Requirements guidelines. Is to be noted that the safeguarding principles assessment for this VPA was made and approved during Transition to GS4GG, thus, new guidance is not applicable. The following mitigation measures were identified:

Safeguarding principles	Assessment questions	Assessment of relevance to the project (Yes/potentially /no)	Justification	Mitigation measure (if required)
3.6.2 Negative Economic Consequences	1. Is the Project financially sustainable, including beyond the Project Certification period? 2. Will the Project have negative impacts on the local economy?	1. Yes 2. Probably	1. The Project will be financed through the generation and sale of carbon credits. After the crediting period ends it is expected that the project ends as well since new (more efficient) technologies are expected to be implemented after the three crediting periods. 2. The Project will have positive	MozCarbon will train charcoal sellers in order to allow them to sell the new cookstoves and thus, reduce the economic impact of the decrease in the charcoal selling.

			impacts on the local economy by reducing fuel consumption costs. These savings will be particularly beneficial for the poorest segments of society. Charcoal sellers might be affected since the consumption of charcoal is expected to be reduced.	
4.3.4 Release of pollutants	Could the Project potentially result in the release of pollutants to the environment?	Yes	Pollutants are released to the air since charcoal is burned in the cookstoves provided by the project.	The released pollutants are minimized at maximum since the cookstoves implemented by the project are more efficient in comparison to the old stoves. Release of pollutants is diminished when compared to the baseline scenario.

a) **Safeguarding Principle: Negative Economic Consequences:**

- Monitoring of the mitigation measure: The project developer implements two selling strategies to deliver stoves to final beneficiaries. The first is through door to door with promoters. The second approach is to use sales agents,

including people with shops and other business to sell the stoves. Part of charcoal sellers (12) are now sales promoters of MozCarbon. Also, part of the sales points (8) is of people who sell jointly charcoal and project stoves, earning commissions on stoves sold.

b) Safeguarding Principle: Release of pollutants:

- Monitoring of the mitigation measure: When compared to traditional stoves, improved stoves reduce the amount of emitted pollutants. This was observed during the Monitoring Period where people perceived reduction in smoke emissions when compared to the baseline scenario. 93.70% of the users report the reduction of smoke levels in houses because of the use of project stoves. Therefore, the release of pollutants is reduced as result of project implementation.

SECTION G. STAKEHOLDER INPUTS AND LEGAL DISPUTES

G.1. List all Inputs and Grievances which have been received via the Continuous Input and Grievance Mechanism together with their respective responses/mitigations.

The grievance mechanism has been fully functional during the monitoring period, as outlined in the following table:

	Method Chosen (include all known details e.g. location of book, phone, number, identity of mediator)	Justification
Continuous Input / Grievance Expression Process Book	Complaints and suggestions book at Sales office, Avenida Nelson Mandela, Maputo, Mozambique Complaints and suggestions book at main office Avenida Filipe Samuel MagaiaNo.1675	Complaints Book is one of the most known grievance mechanisms in institutions in Mozambique. People can register their comments or suggestions/questions using the book available in the field and main office of MozCarbon. Staff will process the information and take actions where needed.
Telephone access	Main Office contacts: +258 21422188 Hortencia Tivane (Sales and Marketing Manager +258 848927159 Sales/Field office: NarcisoSozinho +258 847974200	Telephone is a quick way for reaching Project operator. Phone contacts are also stamped in the waiver/receipt forms so that the, e.g. stove users can quickly call project

	Job Matsinhe: +258 842469813 Obasanjo Dunhe +258 842496730 (during the monitoring period, left at the beginning of 2020)	personnel if there is a problem/comment regarding the project.
Internet/email access	consulta.fogoes@gmail.com info@mozcarbon.co.mz	Email is also available. All emails received by the project will be processed and actions will be taken to follow up with the stakeholders
Nominated Independent Mediator (optional)	N/A	N/A

Grievance can be communicated also directly to Gold standard via mail (help@goldstandard.org) or via telephone (+41 (0) 22 788 7080). During this monitoring period, no complaints were received by the above-described mechanisms.

G.2. Report on any stakeholder mitigations that were agreed to be monitored.

N/A

G.3. Provide details of any legal contest that has arisen with the project during the monitoring period

There are no pending legal disputes on project and on project developer (Mozambique Carbon Initiatives LDA) recorded during the monitoring period.

Revision History

Version	Date	Remarks
1.1	14 October 2020	Hyperlinked section summary to enable quick access to key sections Improved clarity on Key Project Information Section for POA monitoring Forward action request section Improved Clarity on SDG contribution/SDG Impact term used throughout Clarity on safeguard reporting Clarity on design changes Leakage section added for VER/CER projects Addition of Comparison of monitored parameters with last monitoring period Provision of an accompanying Guide to help the user understand detailed rules and requirements
1.0	10 July 2017	Initial adoption