



**Verification and certification report form for
CDM programme of activities
(version 02.0)**

Complete this form in accordance with the instructions attached at the end of this form.

BASIC INFORMATION

Title and UNFCCC reference number of the programme of activities (PoA)	Efficient and Clean Cooking for Mozambican Low Income Households (GS ID: 5562)	
Version number(s) of the PoA-DD(s) to which this report applies	03, dated 04/04/2019	
Version number of the verification and certification report	05.1	
Completion date of the verification and certification report	28/11/2019	
Monitoring period number and duration of this monitoring period	1 st Monitoring; 14/02/2017 to 31/12/2017 (first and last day included)	
Number and version number of the monitoring report to which this report applies	Version09, Dated 27/11/2019	
Coordinating/managing entity (CME)	South Pole	
Host Parties	Host Parties of the PoA	Is this a host Party to a CPA covered in this report? (yes/no)
	The Republic of Mozambique	Yes
Applied methodologies and standardized baselines	AMS-II.G. Energy efficiency measures in thermal applications of non-renewable biomass. Version 10.0	
Mandatory sectoral scopes linked to the applied methodologies	Sectoral Scope 03: Energy Demand	
Conditional sectoral scopes linked to the applied methodologies, if applicable	NA	
Estimated amount of GHG emission reductions or GHG removals for this monitoring period in the included CPAs covered in this report	24,903 tCO ₂ e	
Certified amount of GHG emission reductions or GHG removals for this monitoring period for the included CPAs covered in this report	23,834 tCO ₂ e	
Name and UNFCCC reference number of	EPIC Sustainability Services Private Limited (E-0062)	

the DOE	
Name, position and signature of the approver of the verification and certification report	 Dr.D.Siddaramu, Team Leader  K. Sudheendra, Director and Head Operations

SECTION A. Executive summary

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EPIC Sustainability Services Private Limited (EPIC) has been contracted by South Pole to undertake the independent verification of the registered GS PoA titled “Efficient and Clean Cooking for Mozambican Low Income Households” (GS ID: 5562) covering VPA1 titled “Efficient and Clean Cooking for Mozambican Low-Income Households – George Dimitrov VPA 1” (GS project ID: 6155). The objectives of this verification are to verify and certify emission reductions reported for project activity for the monitoring period of 14/02/2017 to 31/12/2017 (first and last day included); and to verify that the data reported are complete and transparent.

This report summarizes the findings of the verification of the project, performed on the basis of Gold Standard requirements^{/1/}, UNFCCC criteria for CDM as well as criteria given to provide for consistent project operations, monitoring and reporting. Gold Standard toolkit, version 2.2^{/2/} and UNFCCC criteria refer to the Kyoto Protocol, the CDM rules and modalities as agreed in the Bonn Agreement, the Marrakech Accords and the CDM Executive Board's decisions.

The verification team has, based on the recommendations in the Validation and Verification Standard version 2.0^{/3/}, Gold Standard requirements, Gold Standard toolkit, version 2.2 and employed a risk-based approach in the verification, focusing on the identification of significant risks and reliability of project monitoring and generations of GS-VERs. The verification is not meant to provide any consulting towards the client. However, stated request for clarifications and/or corrective actions may provide input for improvement of the project design.

The scope of the verification is the independent and objective review and ex-post determination of the monitored reductions in GHG emission by the project activity. The verification is based on the Validated Project Design Document, version 03, dated 04/04/2019, Validated Component Project Design Document, version 02, dated 04/04/2019 (hereinafter referred to as PoA-DD^{/4/} and VPA-DD^{/5/}), corresponding Validation Report^{/6/ & /7/} and Monitoring Report^{/8/} (hereinafter referred as final MR). These documents were reviewed against the requirements of the Gold Standard requirements, Kyoto Protocol, the CDM Modalities and Procedures and related rules and guidance.

The objective of this project is to replace old inefficient conventional cook stoves (hereinafter referred to as baseline cook stoves) with efficient cook stoves (hereinafter referred to as project cook stoves) by making it available/affordable to low income rural households across the neighbourhood of 25 de Junho, Bagamoyo, George Dimitrov, Inhagoia, Inhagoia A, Nsalene, Magoanine A, Malhazine and Zimpeto (south) in Maputo, Mozambique.

The verification team determines the conformity of the actual project activity and its operation with the VPA-DD and MR. EPIC has, by means of a desk review and an on-site visit, assessed that all physical features of the GS project activity proposed in the PoA-DD are in place, and that the project participants have operated the project activity as per the PoA-DD. Thus the verification team has concluded that the project activity was implemented and operated as per VPA-DD in line with PoA-DD, and that all physical features of the project are in place.

The verification team, based on the site visit and document review, was able to conclude that the project activity has been commissioned and implemented as per the PoA-DD. The start date of this monitoring period is 14/02/2017.

The monitoring report for this monitoring period is in compliance with the monitoring plan of the PoA-DD. The project activity was registered by applying the small scale methodology “AMS-II.G. Energy efficiency measures in thermal applications of non-renewable biomass (Version 10.0)”^{/9/} and the verification was carried out in accordance with the applied methodology. It was confirmed during the site visit that the project activity during the current verification is in accordance with the applicability criteria of the methodology.

It is the responsibility of EPIC to express an independent GHG verification opinion on the GHG emissions reductions and on the calculation of GHG emission reductions from the project for this monitoring period based on the reported emission reduction in the monitoring Report.

EPIC's verification approach was based on the requirements as defined under the Kyoto Protocol, Marrakech accord, as well as those defined by the CDM Executive board. EPIC's approach was risk-based, drawing on an understanding of the risks associated with reported GHG emissions data and the controls in

place to mitigate these. The examination includes assessment of evidence relevant to the amounts and disclosures in relation to the project's GHG emission reductions for this monitoring period.

The verification team has planned and performed the work to obtain the information and explanations that is considered necessary to provide sufficient evidence for it to give reasonable assurance that the amount of calculated GHG emission reductions for this monitoring period were fairly stated.

SECTION B. Verification team, technical reviewer and approver

B.1. Verification team members

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)	Involvement in			
						Desk/document review	On-site inspection	Interview(s)	Verification findings
1.	Team Leader	IR	D	Siddaramu	EPIC	√	√	√	√
2.	Auditor	IR	R	Madhukar	EPIC	√	x	x	√
3.	Host Country Expert	ER	Muzima	Adelio	EPIC	√	√	√	√

B.2. Technical reviewer and approver of the verification and certification report

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)
1.	Technical reviewer	IR	Radhamadhavan	Vijayaraghavan	EPIC
2.	Approver	IR	Sudheendra	Krishnachar	EPIC

SECTION C. Application of materiality in conducting the verification

C.1. Consideration of materiality in planning the verification

No.	Risk that could lead to material errors, omissions or misstatements	Assessment of the risk		Response to the risk in the verification plan and/or sampling plan
		Risk level	Justification	
1.	Errors in manual transfer of records.	Low	Distribution database ^{/10/} , and Usage Survey Database ^{/11/} was manually transferred from the hand-written survey records to the ER calculation spread sheet ^{/12/} .	Verification team checked the Distribution database^{/10/}, and Usage Survey Database^{/11/} as well as the User Agreements of all the 37 sampled users^{/13/}, which are legally-binding and considered credible. In addition, the verification team also conducted acceptance sampling of the sampled users, and visited 37 sampled users as well as 10 non-sampled users during the site visit.

C.2. Consideration of materiality in conducting the verification

In line with Guidelines for Application of materiality in verifications^{/14/}, a reasonable level of assurance are defined for the verification of the project by complete verification of all the values indicated in the emission reduction spread sheet^{/12/} in documents at the document review stage and onsite. There are no material errors, omissions or misstatements.

The verification team has planned and performed the work to obtain the information and explanations that is considered necessary to provide sufficient evidence for it to give reasonable assurance that the amount of calculated GHG emission reductions for this monitoring period were fairly stated.

The verification team has verified that the information included in the revised monitoring report is correct and that the emission reduction achieved has been determined correctly. Based on the information seen and evaluated, the verification team confirms that all parameters are used correctly in the calculations, all results are verifiable and transparent, all assumptions are described and based on verifiable evidence and calculations are done in accordance with the predefined formulae from registered VPA-DD. The total number of ERs achieved during the monitoring period is 23,834 tCO₂e.

SECTION D. Means of verification

D.1. Desk/document review

The verification was performed primarily based on the review of the monitoring report and the supporting documentation. This process included review of data and information presented to verify their completeness and review of the monitoring plan and monitoring methodology, paying particular attention to the frequency of measurements and the QA/QC procedures, and an evaluation of data management and the QA/QC system in the context of their influence on the generation and reporting of emission reduction.

The first MR^{/15/} version 1.0 submitted by the project participant and additional background documents related to the emission reductions are reviewed as an initial step of the verification process. The subsequent step involved the identification of corrective action requests and clarification requests (CAR and CL) which are presented in Appendix 4 of this report. As a result of these findings, the MR is revised to MR version 9.0^{/8/}. A complete list of all documents and records reviewed is as attached in Appendix 3 of this report.

D.2. On-site inspection

Duration of on-site inspection: 09/07/2018 to 11/07/2018				
No.	Activity performed on-site	Site location	Date	Team member
1.	The verification team conducted visits to the project site to confirm the information and to resolve issues identified in the document review. An on-site assessment was conducted as a part of verification activity and involved: 1) an assessment of the implementation and operation of the GS project activity as per the validated PoA-DD/VPA-DD 2) a review of information flows for generating, aggregating and reporting of the monitoring parameters 3) interviews with relevant personnel to confirm that the operational and data collection procedures are implemented in accordance with the Monitoring Plan 4) a cross-check between information provided in the MR and data from other sources 5) a review of calculations and assumptions made in determining the GHG data and Ers, and 6) an identification of QA/QC procedures in place to prevent, or identify and correct, any errors or omissions in the reported monitoring parameters 7) Review of the implementation status of the project activity 8) Review of the Monitoring plan. 9) Verification of Sustainable Development Monitoring Plan and mitigation measures. 10) Visit to households and Interview with stakeholders. Verification of baseline. Operation and maintenance Procedures. Technical details of project. Review of the implementation status of the project activity	Project site	09/07/2018 to 11/07/2018	Dr.D.Siddaramu and Mr.Adelio Muzima

D.3. Interviews

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1.	Chatora	Goodmore	CEO, Mozambique Carbon Initiatives Limitada	09/07/2018 to 11/07/2018	KPT and Usage Survey, Project design, Distribution system of cookstoves, Baseline fuel usage, Type of cookstoves used.	Dr.D.Siddaramu and Mr. Adelio Muzima
2.	Cumbano	Micas Noa	Mozambique Carbon Initiatives Limitada	09/07/2018 to 11/07/2018		
3.	Xerinda	Norato				
4.	Pinto	Jorge Miguel	South pole	09/07/2018	KPT and Usage	

	Monteiro			to	Survey,	Project	
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5.	Marcarini	Abel Alan	South pole			
6.	Pite	Pedro	Chief of Block, Bagamoyo	09/07/2018 to 11/07/2018	Project and households	
7.	Saide	Florincia	Icemetal Ltd	09/07/2018 to 11/07/2018	Raw-Material sourcing. Manufacturing, Numbering of ICS, Quality test	
8.	S.Baniquad	Leiano	Unimetal			
9.	Ernesto	Alice	Bagamoyo	09/07/2018 to 11/07/2018	Usage Survey, Distribution system of cookstoves, Baseline fuel usage, Type of cookstove used.	
10.	S. Mate	Aida	Bagamoyo			
11.	Timane	Julia	Bagamoyo			
12.	Valente Chemane	Carolina	Bagamoyo			
13.	Maposse	Amelia	Bagamoyo			
14.	Sigauque Matsinhe	Delfina	Bagamoyo			
15.	simao	Maria	Bagamoyo			
16.	Machava	Diolinda	Bagamoyo			
17.	Macanze	Ilda	Bagamoyo			
18.	Tembe	Filomena	Bagamoyo			
19.	Jacob	Filomena	Bagamoyo			
20.	Maria	Ana	Bagamoyo			
21.	Novela	Josefina	Bagamoyo			
22.	Fumo	Florencia	Bagamoyo			
23.	Xavier	Luisa	Bagamoyo			
24.	Guambe	Victorino	Bagamoyo			
25.	Mariquel	Atalia	Bagamoyo			
26.	Alberto	Helena	George Dimitrov			
27.	Lourenco	Virginia	George Dimitrov			
28.	Matias Bata	Sandra	George Dimitrov			
29.		Eunicia	George Dimitrov			
30.	Francisco	Tomas	George Dimitrov			
31.	Guambe	Cristina	George Dimitrov			
32.	Farcisco	Acrizia	George Dimitrov			
33.	Alfeu	Ana	George dimitrov			
34.	Mate	Beeatriz	George Dimitrov			
35.	Munguamb e	Isabel Fabio	George Dimitrov			
36.	Nite	Berta	George Dimitrov			
37.	Benze	Cristiana	George Dimitrov			
38.	Ester	Cleste	George Dimitrov			
39.	Pedro	Sandra	George Dimitrov			
40.	Lindoca	Ana	George Dimitrov			
41.	Xivindaze	Marta	George Dimitrov			

42	Lucrencia	Teresa	Magoanine			
43	Raul	Veronica	Magoanine A			
44	Francisco	Isabel	Magoanine			
45	Bata	Jorge	Magoanine			
46	Cossa	Rosita	Magoanine			
47	Jose	Adelaide	Magoanine			
48	Olimpio	Anabela	Magoanine			
49	Mate	Carlos Laisse	Magoanine			

D.4. Sampling approach

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The total number of stoves distributed at the end of the monitoring period in the Project is 7,149 but, operational stoves were only 5,739. The verification team used acceptance sampling approach for checking the operational status of the improved cook stoves. A sample size of 22 was required, based on an AQL of 0.5% and UQL of 15%, the producer risk used is 5% and consumer risk used was 10%. In accordance with the para 33 (a) of "Sampling and surveys for CDM project activities and programmes of activities" ^{/16/}, version 07.0 has been chosen "The estimated volume of annual GHG emission reductions of the project activity or the PoA being verified is equal to or less than 100,000 t CO₂ eq."

As the VPA includes distribution of 03 types of improved cookstoves models; a stratified random sampling approach was followed by the verification team. The verification team visited 37 households (and 10 household's non-sampled users during the site visit). The number of ICS model visited are as follows in the neighbourhood of Bagamoyo, George Dimitrov and Magoanine A (south) in Maputo, Mozambique.

ICS Model	Sample visited
Envirofit CH2200	06
Envirofit Econchar	21
Envirofit Rocketworks	10

It was observed that all the cook stoves visited were in working condition and no discrepant records were observed with the published MR, "Distribution and Monitoring Database". Thus PP's set of records has been accepted in line with para 30 of "Sampling and surveys for CDM project activities and programmes of activities", version 07.

D.5. Clarification requests, corrective action requests and forward action requests raised

Areas of verification findings	No. of CL	No. of CAR	No. of FAR
Compliance of the monitoring report with the monitoring report form	0	0	0
Compliance of the project implementation and operation with the registered PDD	0	0	0
Post-registration changes	0	0	0
Compliance of the registered monitoring plan with the methodologies including applicable tools and standardized baselines	0	CAR01	0
Compliance of monitoring activities with the registered monitoring plan	0	0	0
Compliance with the calibration frequency requirements for measuring instruments	0	0	0
Assessment of data and calculation of emission reductions or net removals	CL01 and CL05	0	0
Assessment of reported sustainable development co-benefits	0	0	0
Global stakeholder consultation	0	0	0
Others (please specify)			
Sampling	CL02		0
Traditional stove disposal	CL03	0	0
Double counting	CL04	0	0
Records/documents submission	0	CAR02	0

Technical life of Cookstoves	0	0	FAR01
Total	05	02	01

SECTION E. Verification findings

E.1. General

E.1.1. Compliance of the monitoring report with the monitoring report form

Means of verification	The verification team determined whether the monitoring report was completed using the valid version of the applicable monitoring report form. The verification team has checked whether all the sections of the monitoring report follows the guidelines provided in the template itself.
Findings	No CARs/CLs were raised in this section.
Conclusion	The verification team concludes that the monitoring report provides all the information in accordance with the valid version of the Gold standard version 2.2 - Monitoring report ^{17/} and the instructions therein for filling. The monitoring report has been prepared in line with VVS-PoA, version 02.0.

E.1.2. Remaining forward action requests from validation and/or previous verifications

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The verification team has reviewed the validation report and observed that there was no FAR. EPIC has not raised a forward Action Request (FAR) during this verification process.

E.1.3. CPAs considered for verification and covered in this report

Title and UNFCCC reference number of the CPA included in the PoA as of the end of this monitoring period	Is the CPA considered for this verification? (yes/no)	The date when the CPA was included	Version of the PoA-DD	Confirmation that a request for issuance including the CPA has been published for the previous monitoring period (Y/N)
Efficient and Clean Cooking for Mozambican Low Income Households (GS ID: 6155)	Yes	04/04/2019	03	NA, as this is the 1 st monitoring report for this VPA

E.2. Programme of activities

E.2.1. Compliance of the programme implementation with the registered programme design document

Means of verification	The verification team determined the conformity of the actual project activity and its operation with the registered project design document. EPIC has, by means of a desk review and an on-site visit, assessed that all physical features of the project activity in the registered PoA-DD are in place, and that the project participants have operated the project as per the registered PoA-DD.
Findings	No CARs/CLs were raised in this section.
Conclusion	The verification team by means of an on-site inspection and document review concludes that the project activity was implemented and operated as per the registered PoA-DD and validated VPA-DD and that all physical features of the project are in place. A total of 7,149 cook stoves were distributed in the project, which includes 1. 5,052 cook stoves of Econochar model, 2. 646 cook stoves of Envirofit CH220 model and 3. 1,451 cook stoves of Rocketworks Cha Zama model. were distributed during 2016 and /2017, out of which only 5,731 cook stoves were operational. The cook stoves can be easily tracked using cook stove IDs punched on them. Thus the verification team states that the implementation of the project matches with that mentioned in the registered PoA-DD and VPA-DD. Overall 80% of the ICS are in use in the monitoring period i.e., as per model, ➤ 82% of the Envirofit CH2200,

	➤ 79% of the Envirofit Econchar, and ➤ 84% of the Rocketworks Cha Zama cook stoves are in use.
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E.2.2. Implementation and operation of the management system

Means of verification	The verification team determined the roles and responsibilities, training arrangements and capacity development, procedure for technical review of inclusion of VPA's, data management responsibilities, detailed record-keeping system for each VPA under the PoA, and how the process performance documentation, and relevant evidences are explained in the VPA-DD ^{/3/} .
Findings	No CARs/CLs were raised in this section.
Conclusion	Verification team evaluated the management systems in place to implement the monitoring of the project activity. This included the management structure, records and document control process, procedures for training, continuous improvement of the PoA management system, record keeping system, procedures for double counting. The PoA management system including the record-keeping system and the management structure has been explained in section C of the registered PoA DD. During the course of verification, verification team based on review of section B.1 of the monitoring report, supporting documents and interview/observation has assessed this management system. The verification team confirms that the monitoring management systems of the GS PoA are in place; with the responsibilities properly identified and in place as described.

E.2.3. Post-registration changes

E.2.3.1. Temporary deviations from the registered monitoring plan, applied methodology or applied standardized baseline

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There is no such change

E.2.3.2. Corrections

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There are no corrections in this monitoring period.

E.2.3.3. Inclusion of a monitoring plan

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Not applicable

E.2.3.4. Permanent changes to the registered monitoring plan or permanent deviation of monitoring from the applied methodology, standardized baseline or other applied standards or tools

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There is no such change

E.2.3.5. Changes to the programme design or project design

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There is no such change.

E.2.3.6. Change of coordination/managing entity

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There is no such change.

E.2.3.7. Changes specific to afforestation and reforestation activities

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Not applicable as the project does not involve afforestation and reforestation activity.

E.3. Component project activities**E.3.1. Compliance of the CPA implementation with the included CPA design document**

Means of verification	The verification team determined how the generic VPA is part of a PoA-DD and checked how each technology/measure, methodology and combination thereof, or that technologies/measures have been combined in one generic VPA-DD in accordance with the relevant requirements in the "CDM project standard for programmes of activities, version 01.0".
Findings	No CARs/CLs were raised in this section
Conclusion	The verification team concludes that the VPA description of the project contained in the registered VPA-DD to be complete and accurate. The VPA-DD complies with the relevant methodology, tools, forms and guidance at the time of VPA-DD submission for registration/inclusion. A total of 7,149 cook stoves were distributed in the project, which includes 1. 5,052 cook stoves of Econochar model, 2. 646 cook stoves of Envirofit CH220 model and 3. 1,451 cook stoves of Rocketworks Cha Zama model were distributed during 2016 and 2017, out of which only 5,731 cook stoves were operational. The cook stoves can be easily tracked using cook stove IDs punched on them. Thus the verification team states that the implementation of the project matches with that mentioned in the registered PoA-DD and VPA-DD.

E.3.2. Post-registration changes**E.3.2.1. Temporary deviations from registered monitoring plan, applied methodology or applied standardized baseline**

>>

There is no such change

E.3.2.2. Corrections

>>

There are no corrections in this monitoring period.

E.3.2.3. Changes to the start date of the crediting period of component project activities

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There is no such change.

E.3.2.4. Inclusion of a monitoring plan

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Not applicable as monitoring plan was part of the validated VPA

E.3.2.5. Permanent changes to the registered monitoring plan or permanent deviation of monitoring from the applied methodology, standardized baseline, or other applied standards or tools

>>

There is no such change.

E.3.2.6. Changes to the programme design or project design

>>

There is no such change.

E.3.2.7. Changes specific to afforestation and reforestation component project activities

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Not applicable as the project does not involve afforestation and reforestation activity.

E.3.3. Compliance of the registered monitoring plan with the methodology including applicable tool(s) and standardized baseline

Means of verification	The verification team determined whether the registered monitoring plan is in
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	accordance with the applied methodology including applicable tools.
Findings	CAR01 was raised in this section
Conclusion	The verification team is able to confirm that the monitoring plan contained in the registered VPA-DD is in accordance with the approved methodology applied i.e., AMS-II.G (version 10). The monitoring plan contained in the PoA-DD/VPA-DD is in accordance with the approved methodology applied by the project activity and its applicable tools.

E.3.4. Compliance of monitoring activities with the registered monitoring plan

E.3.4.1. Data and parameters fixed ex ante or at renewal of crediting period

Means of verification	The verification team has determined whether all ex-ante parameters used for emission reduction calculation stated in the registered monitoring plan are used appropriately as per the registered VPA-DD.
Findings	No CAR/CL was raised in this section
Conclusion	Verification team confirms that the data and parameters fixed ex-ante are in compliance with the registered VPA-DD and monitoring plan. Please refer Appendix 5 for details.

E.3.4.2. Data and parameters monitored

Means of verification	The verification team has determined whether the registered monitoring plan has been properly implemented and followed by the PP that the monitoring has been carried out in accordance with the registered monitoring plan.
Findings	No CAR/CL was raised in this section
Conclusion	The verification team has assessed the data and parameter monitored during the monitoring period and confirms that all the ex-ante and ex-post parameters are monitored in accordance with the approved monitoring plan and applied methodology. Please refer Appendix 5 for details. In the usage survey (conducted biannual) a sample size of 247 families (i.e., 176 cook stoves of Econochar model, 33 cook stoves of Envirofit CH220 model and 38 cook stoves of Rocketworks Cha Zama model) for this monitoring period was set by PP as calculated in the separate Excel spreadsheet, in line with the applied methodology, is at least 95/10 (a 95% confidence interval and a 10% margin of error). The required confidence/precision level was met and reached. The required confidence/precision level was met as all the randomly selected households were reached and participated in the survey. PP had selected 204 households for KPT survey (i.e., 147 cook stoves of Econochar model, 19 cook stoves of Envirofit CH220 model and 38 cook stoves of Rocketworks Cha Zama model), in line with the applied methodology. The required precision of least 90/10 (a 90% confidence interval and a 10% margin of error) is applied in line with the applied methodology and the required confidence/precision level was met as all the randomly selected households were reached and participated in the survey.

E.3.4.3. Implementation of sampling plan

Means of verification	The verification assessed whether the compliance of the sampling efforts and surveys with the registered sampling plan in accordance with the "Guidelines for sampling and surveys for CDM project activities and programme of activities" if PP had applied a sampling approach to determine data and parameters monitored.
Findings	CL02 was raised in this section
Conclusion	The verification team was able to confirm that a "stratified random sampling" was conducted by PP as a sampling approach for monitoring. The monitoring plan contained a detailed description in accordance with the "Guidelines for sampling and surveys for CDM project activities and programme of activities", version 07/¹³. In the usage survey (conducted biannual) a sample size of 247 families (i.e., 176 cook stoves of Econochar model, 33 cook stoves of Envirofit CH220 model and 38 cook stoves of Rocketworks Cha Zama model) for this monitoring period was set by PP as calculated in the separate Excel spreadsheet, in line with the applied methodology, is at least 95/10 (a 95% confidence interval and a 10% margin of error). The required confidence/precision level was met and reached. The required confidence/precision level was met as all the randomly selected households were

	reached and participated in the survey. For KPT survey (conducted annually) PP had selected 204 households (i.e., 147 cook stoves of Econochar model, 19 cook stoves of Envirofit CH220 model and 38 cook stoves of Rocketworks Cha Zama model) for this monitoring period was set by PP as calculated in the separate Excel spreadsheet, in line with the applied methodology. The required precision of least 90/10 (a 90% confidence interval and a 10% margin of error) is applied in line with the applied methodology and the required confidence/precision level was met as all the randomly selected households were reached and participated in the survey.
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E.3.4.4. Compliance with the calibration frequency requirements for measuring instruments

Means of verification	The verification team determined whether the calibration of the measuring equipment that has an impact on the claimed emission reductions is conducted by the PP at a frequency specified in the registered monitoring plan.										
Findings	No CAR/CL was raised in this section										
Conclusion	The key monitoring equipment used for conducting the stove efficiencies is weighing scale. The appropriate QA/QC procedures have been followed for the monitoring parameters. The weighing scale used for the monitoring of parameters is Digital Spring Scale WeiHeng. Calibration scale: <table border="1"> <tr> <td>Calibration Scale</td><td>Ohaus Ranger 30</td></tr> <tr> <td>BECT Code</td><td>BECT 007</td></tr> <tr> <td>Cal. Weight</td><td>5000 gr</td></tr> <tr> <td>Measurement (gr)</td><td>5000</td></tr> <tr> <td>Control weight (gr)</td><td>2206</td></tr> </table> Calibration was performed by Biomass Energy Certification & Testing Center (BECT) and is valid for the instruments used in the monitoring. The validity of calibration is up to 20/12/2018^{/18/}	Calibration Scale	Ohaus Ranger 30	BECT Code	BECT 007	Cal. Weight	5000 gr	Measurement (gr)	5000	Control weight (gr)	2206
Calibration Scale	Ohaus Ranger 30										
BECT Code	BECT 007										
Cal. Weight	5000 gr										
Measurement (gr)	5000										
Control weight (gr)	2206										

E.3.5. Assessment of data and calculation of emission reductions or net removals

E.3.5.1. Calculation of baseline GHG emissions or baseline net GHG removals by sinks

Means of verification	The verification team assessed whether the data and calculations of baseline emission resulting from the registered VPA-DD is correct. The verification team has checked whether calculations of baseline GHG emissions have been carried out in accordance with the formulae and methods described in the registered monitoring plan.
Findings	No CAR/CL was raised in this section
Conclusion	The equations for baseline emissions, as provided in the monitoring report and confirmed with the registered VPA-DD and the methodology AMS-II.G, version 10 are: $ER_y = B_{y,savings} * f_{NRB,y} * NCV_{biomass} * EF_{projected_fossilfuel} * N_{y,i}$ Where: ER_y = Emission reductions during the year y in tCO₂e B_{y,savings} = Quantity of woody biomass that is saved in tonnes per device f_{NRB,y} = Fraction of woody biomass saved by the project activity in year y that can be established as non-renewable biomass using survey methods or government data or default country specific fraction of non-renewable woody biomass (f_{NRB}) values available on the CDM website NCV_{biomass} = Net calorific value of the non-renewable woody biomass that is substituted (IPCC default for wood fuel, 0.015 TJ/tonne, wet basis) EF_{projected_fossilfuel} = Emission factor for the substitution of non-renewable woody biomass by similar consumers. Use a value of 81.6 tCO₂/TJ N_{y,i} = Number of project devices of type i operating in year y Determination of B_{y,savings} In order to determine ex post B_{y,savings} equation 1 of Option 2 described in paragraph 22 of AMS-II.G is chosen and therefore, the following equation is used:

$$ER_y = \sum \sum ER_{y,i,j} - LE_{y,ji} \quad \text{----- Equation (1)}$$

Where:

i = Indices for the situation where more than one type of project device is introduced to replace the pre-project devices⁶

j = Indices for the situation where there is more than one batch of project device

ER_y = Emission reductions during year y in t CO_{2e}

$ER_{y,i,j}$ = Emission reductions by project device of type i and batch j during year y in t CO_{2e}

LE_y = Leakage emissions in the year y

The verification team confirms that equations for baseline emissions provided in the monitoring report and confirmed with the registered VPA-DD and the methodology AMS-II.G, version 10

Parameter	Description	Unit	Value	Data Source
B _{old}	Quantity of woody biomass used in the absence of the project activity in tonnes per device	t/device/year	2.76	Calculated from KPT survey
Usage rate	Based on usage survey; 80% of the ICS are still in use. As per model, Envirofit CH2200-82% in use, Envirofit Econchar -79% in use and Rocketworks Cha Zama - 84% in use. This usage rate (80%) is applied for the ER calculations ensuring that only the operational devices (i.e., project stoves which are used daily) are included in the ER calculations.	Percentage	80% (As per model, Envirofit CH2200-82% in use, Envirofit Econchar - 79% in use and Rocketworks Cha Zama - 84% in use). 97.6% of the users claim that the ICS is its main cookstove and 26.72% of the surveyed use no cooking device other than the improved charcoal cookstove.	Survey
LAF	Leakage adjustment factor to account for leakages		0.95	Methodology AMS-II.G
B _{y,new, KPT}	Annual quantity of woody biomass used in year y in tonnes per device, measured as per the Kitchen Performance Test (KPT) protocol	t/device/year	3.00	Project KPT ^{/19/} , See below

	$f_{NRB, y}$	Fraction of woody biomass saved by the project activity in year y that can be established as non-renewable biomass		0.91	National Default Value. See section D.4 of the PoA-DD
	$NCV_{biomass}$	Net calorific value of the non-renewable woody biomass that is substituted	TJ/t	0.0029	IPCC default for wood fuel, 0.015 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. Hence PP has used 0.029 as charcoal is used.
	$EF_{projected_fossilfuel}$	Emission factor for the substitution of non-renewable woody biomass by similar consumers	tCO ₂ /TJ	63.7	AMS-II G Default Value
	ER_y	Emission reductions during the year y in tCO _{2e}	tCO ₂ /device/year	23,834	Calculated
Total baseline emissions calculated are 112,542 tCO _{2e} .					

E.3.5.2. Calculation of project GHG emissions or actual net GHG removals by sinks

Means of verification	The verification team assessed whether the data and calculations of project emission resulting from the registered PoA-DD is correct. The verification team has checked whether calculations of project GHG emissions have been carried out in accordance with the formulae and methods described in the registered monitoring plan.
Findings	There is no CAR/CL raised in this section.
Conclusion	The project achieved during the monitoring period is 87,453 tCO _{2e} .

E.3.5.3. Calculation of leakage GHG emissions

Means of verification	The verification team assessed whether the data and calculations of leakage emission resulting from the registered PoA-DD is correct. The verification team has
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	checked whether calculations of leakage GHG emissions have been carried out in accordance with the formulae and methods described in the registered monitoring plan.
Findings	CL01 was raised in this section
Conclusion	A default (0.95) Net to gross adjustment factor to account for leakages (B_{old}) has been considered by the project and thus it is in line with the requirement of monitoring methodology and the VPA-DD. Total leakages for the current monitoring period is 1,254 tCO ₂ e.

E.3.5.4. Summary of calculation of GHG emission reductions or net GHG removals by sinks

Means of verification	The verification team assessed whether the data and calculations of GHG emission reductions achieved resulting from the registered GS project activity. The verification team has checked whether calculations of GHG emission reduction have been carried out in accordance with the formulae and methods described in the registered monitoring plan.
Findings	CL05 was raised in this section
Conclusion	Verification team confirms that all parameters are used correctly in the calculations, all results are verifiable and transparent, all assumptions are described and based on verifiable evidence and calculations are done in accordance with the predefined formulae from registered VPA-DD. The total number of ERs achieved during the monitoring period is 23,834 tCO ₂ e. In summary, verification team confirms that actual emission reduction is lower than the estimate of the registered (included)/approved VPA-DD for the current monitoring period.

Title and UNFCCC reference number of the CPA	Baseline emissions or baseline net GHG removals by sinks (tCO ₂ e)	Project emissions or actual net GHG removals by sinks (tCO ₂ e)	Leakage (tCO ₂ e)	GHG emission reductions or net GHG removals by sinks (tCO ₂ e)		
				Amount achieved before 1 January 2013	Amount achieved from 1 January 2013	Amount achieved in the entire monitoring period
VPA1 – (14/02/2017 to 31/12/2017)	112,542	87,453	1,254	0	23,834	23,834
Total	112,542	87,453	1,254	0	23,834	23,834

E.3.5.5. Comparison of actual GHG emission reductions or net GHG removals by sinks with estimates in included CPA

Means of verification	The verification team has determined the VER achieved during this monitoring period with the estimated value and reason for increase if any.
Findings	No CAR/CL was raised in this section
Conclusion	The verification team analysed the emission reductions reported during the subject monitoring period in comparison with the estimate in the registered CPA-DDs, and found that the ex-ante determined value is on the lower side in comparison to the actual realised value.

Title and UNFCCC reference number of the CPA	Value estimated in ex ante calculation in the included CPA-DD(s)	Actual values achieved by the CPAs during this monitoring period
VPA1	24,903 tCO ₂ e	23,834 tCO ₂ e
Total	24,903 tCO ₂ e	23,834 tCO ₂ e

E.3.5.6. Remarks on difference from estimated value in included CPA

Means of verification	The verification team checked the actual values achieved by the VPA during this monitoring period with the values estimated in ex-ante calculation in the included VPA-DD
Findings	No CAR/CL was raised in this section
Conclusion	The VER achieved in this monitoring period is 23,834 tCO ₂ e as compared to ex-ante estimates of 24,903 tCO ₂ e indicated in the validated VPA-DD ^{44/} . In summary, verification team confirms that actual emission reduction is lower than the estimate of the registered (included) VPA-DD for the current monitoring period. Since the actual values are less than ex-ante values no further explanations is deemed necessary.

E.3.6. Assessment of reported sustainable development co-benefits

Means of verification	Sustainable development co-benefits are reported in MR. Further, it is also confirmed that PP has monitored the sustainable development co-benefits.
Findings	No CAR/CL was raised in this section
Conclusion	Refer Appendix 5 for details.

E.3.7. Global stakeholder consultation

Means of verification	Not Applicable
Findings	Not Applicable
Conclusion	Not Applicable

SECTION F. Internal quality control

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After the completion of assessment by the verification team all the relevant documentation is submitted to a qualified, Independent Technical reviewer as part of EPIC' internal quality control system. A Technical reviewer team is appointed to review the draft final verification report (Draft FVR). The comments made by the Technical reviewer team are taken into consideration and incorporated in the final FVR. The technical reviewer team assesses whether all the reporting requirements have been fulfilled and whether all the issues raised were closed satisfactorily by the verification team with justification. The technical review process can also raise issues in this regard which is resolved further by the verification team to the satisfaction of the technical reviewer. The technical reviewer team either accepts or rejects the report made by the verification team. The final report (after resolutions of all findings) is then submitted to the Head-operations for review and approval.

SECTION G. Verification opinion

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EPIC Sustainability Services Private Limited (EPIC) has been contracted by South Pole to undertake the independent verification of the registered GS PoA titled "Efficient and Clean Cooking for Mozambican Low Income Households" (GS ID: 5562) covering VPA1 titled "Efficient and Clean Cooking for Mozambican Low-Income Households – George Dimitrov VPA 1" (GS ID: 6155). The objectives of this verification are to verify and certify emission reductions reported for project activity of 14/02/2017 to 31/12/2017 (first and last day included); and to verify that the data reported are complete and transparent.

The verification team determines the conformity of the actual project activity and its operation with the validated project design document. EPIC has, by means of a desk review and an on-site visit, assessed that all physical features of the proposed project activity proposed in the PoA-DD / VPA-DD are in place, and that the project participants have operated the project activity as per the PoA-DD. Thus the verification team has concluded that the project activity was implemented and operated as per PoA-DD, and that all physical features of the project are in place.

The verification team, based on the site visit and document review, was able to conclude that the project activity has been commissioned and implemented as per the PoA-DD. The start date of this monitoring period is 14/02/2017.

The monitoring report for this monitoring period is in compliance with the monitoring plan of the validated PDD. The verification team was able to confirm that the monitoring plan contained in the registered PoA-DD is in accordance with the approved methodology applied by the project activity "AMS-II.G. Energy efficiency measures in thermal applications of non-renewable biomass" (Version 10.0) and its applicable

tools. It was confirmed during the site visit that the project activity during the current periodic verification is in accordance with the applicability criteria of the methodology.

The management of project participants is responsible for the preparation and reporting of GHG emissions data, and the reported GHG emission reduction on the basis set out within the project monitoring plan. The development and maintenance of records and reporting procedures in accordance with the monitoring plan, including the calculation and determination of GHG emission reduction from the project is the responsibility of the management of the project. It is the responsibility of EPIC to express an independent GHG verification opinion on the GHG emissions reductions and on the calculation of GHG emission reductions from the project for this monitoring period based on the reported emission reduction in the monitoring Report.

EPIC's verification approach was based on the requirements as defined under the Gold Standard requirements, Kyoto Protocol, Marrakech accord, as well as those defined by the CDM Executive board. EPIC's approach was risk-based, drawing on an understanding of the risks associated with reported GHG emissions data and the controls in place to mitigate these. The examination includes assessment of evidence relevant to the amounts and disclosures in relation to the project's GHG emission reductions for this monitoring period.

The verification team has planned and performed the work to obtain the information and explanations that is considered necessary to provide sufficient evidence for it to give reasonable assurance that the amount of calculated GHG emission reductions for this monitoring period were fairly stated.

The verification team has verified that the information included in the revised monitoring report is correct and that the emission reduction achieved has been determined correctly. Based on the information seen and evaluated, the verification team confirms the following:

Project title:	Efficient and Clean Cooking for Mozambican Low-Income Households – George Dimitrov VPA 1
GS project id:	PoA GS ID: 5562 VPA1 GS ID: 6155
Crediting period:	Renewable Crediting period starting from 14/02/2017 (i.e., the duration are 07 years with the possibility to renew the crediting period twice until year 21 years)
PoA-DD VPA-DD Monitoring report	Version 03, dated 04/04/2019 Version 02, dated 04/04/2019 Version 09 dated 27/11/2019
Methodology used for verification:	AMS-II.G. Energy efficiency measures in thermal application of non-renewable biomass, version 10.0
Applicable monitoring period:	14/02/2017 to 31/12/2017 (first and last day included)
Emissions reductions verified:	23,834 tCO _{2e}

SECTION H. Certification statement

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EPIC Sustainability Services Private Limited (EPIC) has carried out the independent verification of the registered GS PoA titled "Efficient and Clean Cooking for Mozambican Low Income Households" (GS ID: 5562) covering VPA1 titled "Efficient and Clean Cooking for Mozambican Low-Income Households – George Dimitrov VPA 1" for the monitoring period of 14/02/2017 to 31/12/2017 (first and last day included)

The project participants are responsible for the collection of data in accordance with the monitoring plan and the reporting of GHG emissions reductions from the project activity.

EPIC takes responsibility for issuance of an independent verification statement on the reported GHG emission reductions from the project activity.

The verification was done on the basis of the baseline and monitoring methodology (End-use energy efficiency improvement; “AMS-II.G. Energy efficiency measures in thermal applications of non-renewable biomass” (Version 10.0) and the monitoring report (version 9.0, dated 27/11/2019). The verification included checking whether the provisions of the monitoring methodology and the monitoring plan were consistently and appropriately applied and the collection of evidence supporting the reported data.

The emission reductions are calculated correctly and EPIC could certify that the emission reductions from the GS project id: 6155 “Efficient and Clean Cooking for Mozambican Low-Income Households – George Dimitrov VPA 1” for the monitoring period of 14/02/2017 to 31/12/2017 (first and last day included) is 23,834 tonnes of CO₂ equivalent.

Appendix 1. Abbreviations

Abbreviations	Full texts
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CER	Certified Emission Reduction(s)
CL	Clarification request
CME	Coordinating and Managing Entity
CO ₂	Carbon dioxide
CO ₂ e	Carbon dioxide equivalent
CPA-DD	Component Project Design Document
DNA	Designated National Authority
FAR	Forward Action Request
GHG	Greenhouse gas(es)
GWP	Global Warming Potential
KPT	Kitchen Performance Test
IPCC	Intergovernmental Panel on Climate Change
MP	Monitoring Plan
MR	Monitoring Report
PDD	Project Design Document
PoA-DD	Programme Design Document
PS	Project Standard
UNFCCC	United Nations Framework Convention on Climate Change
VVS	Clean Development Mechanism Validation and Verification Standard

Appendix 2. Competence of team members and technical reviewers

The following validation team has been assigned to carry out the verification of the project.

Name	Dr.D.Siddaramu	Dr.R.Madhukar	Mr. Adelio Muzima	Mr. R. Vijayaraghavan
Role	Lead Auditor	Auditor	Host country and Technical expert	Technical Reviewer team
Competence in relevant sectors	Sector 1	Sector 1 and 13	Sector 3	Sector 1 and 13
Responsibility	Document review, onsite, DVer preparation, DVer resolution, FVer preparation	Document review, DVer preparation, FVer preparation	Document review, onsite	Technical review

Dr. D. Siddaramu holds a M.Sc., Ph.D in Environmental Science, with over 16 years of experience. A qualified Clean Development Mechanism (CDM) Lead Auditor, successfully registered more than 30 projects with United Nations Framework Convention on Climate Change (UNFCCC) and Verified Carbon Standard registry (VCS) registry; well versed with both National and International legal regime. Has hands on experience in Environmental Impact Assessment (EIA) studies pertaining to different Ecosystem; monitoring, collection & analyzing environmental samples and conducting socio-economic surveys; data analysis. Conducting CDM/VCS audits, preparation of validation protocols and reports. He is qualified for Sector 1 based on CDM accreditation requirements and qualified lead auditor as per GS Toolkit version 2.2 EPIC accreditation.

Mr Adelio Muzima holds a Degree in Applied Physics. From 2016 onwards has been working as freelancer for data collection and Surveys for household and community level projects implemented in multiple locations in Mozambique. He has performed several verification, validation, satisfaction surveys, CES, KPT based on random visits to beneficiaries of the systems and reported to the implementing partners. He has working

knowledge of the sector and is qualified as Technical and Host Country Expert for TA 3.1 Energy demand in accordance with the procedures of EPIC.

Dr. R. Madhukar, holds a Doctoral in Environmental Science. He has more than 9 years of experience in different industries, consultancy and research and development in Environmental Impact Assessment. He has three years' experience and has participated in the validation / verification of various CDM/VCS/GS/GHG globally. He has undergone extensive training on CDM validation and verification and has been qualified as Auditor for Sectoral Scope 1 under Technical Area "1.2-Renewables". He is also an ISO 26000 lead auditor certified by Professional Evaluation and Certification Board (PECB). He has successfully completed the course on Carbon Monitoring in CDM Afforestation and Reforestation projects conducted by World Bank Institute. He has undergone extensive training on forestry audit requirements for various regimes including CDM, VCS, CCBA, Plan Vivo on several occasions. He has participated as part of the technical review team in various forestry projects across various regimes and has undergone training in methodologies and processes related to forestry auditing. He has on-site audit experience in forestry projects under VCS, CCB and Plan Vivo regimes.

Mr. R. Vijayaraghavan, holds BE in Mechanical Engineering, M.Tech in Energy Conservation and Management and MBA in Technology Management. He is certified as Energy Auditor by Bureau of Energy Efficiency (BEE), Government of India. He has 10 years of working experience in energy sector including validation / verification of fifty CDM and VCS/GS projects and has undergone extensive training on CDM validation and verification and has been qualified as technical reviewer for several sectoral scopes. He is also an ISO 26000 lead auditor certified by Professional Evaluation and Certification Board (PECB).

Appendix 3. Documents reviewed or referenced

No.	Author	Title	References to the document	Provider
1	Gold Standard	Gold Standard Requirements	https://www.goldstandard.org/projectdevelopers/standarddocuments	Gold Standard
2	Gold Standard	Gold Standard toolkit, version 2.2	https://www.goldstandard.org/projectdevelopers/standarddocuments	Gold Standard
3	UNFCCC	Validation and Verification Standard for PoA, version 2.0	http://cdm.unfccc.int/Reference/index.html	UNFCCC
4	PP	Validated Project Design Document, version 03 (PoA-DD), dated 04/04/2019,	-	PP
5	PP	Validated Voluntary Project Activities - Design Document (VPA-DD), version02, dated 04/04/2019	-	PP
6	PP	PoA-DD - Validation Report	-	PP
7	PP	VPA-DD - Validation Report	-	PP
8	PP	Monitoring Report, version 09, dated 27/11/2019 (Final)	-	PP
9	UNFCCC	AMS-II.G. Energy efficiency measures in thermal applications of non-renewable biomass, version 05.0	http://cdm.unfccc.int/methodologies/DB/HLXIKEIBAXBE4EHO24H5IAB824MBD8	UNFCCC
10	PP	Distribution database	-	PP

11	PP	Usage Survey Database	-	PP
12	PP	Emission reduction calculation sheet	-	PP
13		User Agreements	-	PP
14	UNFCCC	Guidelines for Application of materiality in verifications	http://cdm.unfccc.int/	UNFCCC
15	PP	Monitoring Report, version 01, dated 30/05/2018 (Initial)	-	PP
16	UNFCCC	Standard for sampling and surveys for CDM project activities and Programme of Activities, version 07	http://cdm.unfccc.int/	UNFCCC
17	Gold standard	Gold standard version 2.2 - Monitoring report	https://www.goldstandard.org/projectdevelopers/standarddocuments	Gold Standard
18	PP (Third party)	Calibration report - Biomass Energy Certification & Testing Center (BECT)	-	Third party (BECT)
19	PP (Third party)	Kitchen performance testing (KPT) – Chamanculo neighbourhood/Maputo – Mozambique 2014	-	Third party
20	PP	Project Passport	-	PP
21	PP	Staff records & staff contracts	-	PP

Appendix 4. Clarification requests, corrective action requests and forward action requests

Table 1. Remaining FAR from validation and/or previous verification

FAR ID	NA	Section no.	Document Review	Date: 03/12/2018
Description of FAR				
NIL				
Project participant response				Date: DD/MM/YYYY
Documentation provided by project participant				
DOE assessment				Date: DD/MM/YYYY

Table 2. CL from this Verification

CL ID	01	Section no.	Document Review	Date: 03/12/2018
Description of CL				
PP to clarify				
- How he has monitored and taken into account in estimation of ER that if traditional/old cook stoves are still operational and - If use of different fuels (i.e., Kerosene, LPG, Electricity, etc.) is foreseen, how the diversity is managed in the calculations of emission reduction				
Project participant response				Date: 18/12/2018
1. An adjustment factor is applied to account for the non-use of the efficient cook stoves. In section I.6.1 of the CDM-PoA-DD-FORM it is explained that the factor μ_y is used in equation 2 to account for any continued use of pre-project devices during the year y. This parameter is monitored at least once every two years through surveys reporting if the new cookstove is being used as the main cook system and how often these stoves are used for cooking. 2. The use of different fuels is foreseen by the PO. The monitoring survey has a section dedicated to the determination of the cooking habits. The usage of wood cookstoves, traditional charcoal cookstoves, ICSs, LPG stoves and electrical stoves can be accounted for. Nevertheless, the usage of the ICSs shouldn't affect or be affected by the use of LPG or electrical stoves, since they are used to meet different ends. For example, the LPG stoves are used to heat up small servings of milk and the ICS or traditional stoves are used to cook. This is mainly because the LPG cannot be bought in small amounts, unlike the charcoal. Therefore, its use is reduced and relegated to specific tasks, to avoid having to buy a LPG bottle in the middle of the month, for example, when the family lacks funds to do so. In the other hand, it is always possible to buy very small amounts of charcoal, sometimes just enough to cook a couple of meals, for a very accessible price.				
Documentation provided by project participant				
The estimation of μ_y is presented in the supporting folder: '030918 Survey relevant results'. Please consult "Data", columns BY and BW.				
DOE assessment				Date: 22/12/2018
The clarification by PP on impact of traditional (old) and project cook stoves not in use is clear. The impact of this on ER calculations is now clear from the ER calculation sheets, checked, found ok and acceptable as PP is not accounting the use of additional fuels (i.e., LPG or electricity) in ER calculations (i.e., baseline nor in the project scenario). The main cooking fuel used in the project area is charcoal, which was evident from the site visit, initial Baseline Survey and Usage Survey data. Hence CL01 is closed				

CL ID	02	Section no.	Document review	Date: 03/12/2018
Description of CL				
Clarify how the sample size was selected for usage survey/KPT in this monitoring report				
Project participant response				Date: 18/12/2018
The sample size was calculated based on the three different models of ICS distributed during the period as explained on page 19 of the document '180622_101.1-T-MonitoringReport_track change'.				
Documentation provided by project participant				
'180622_101.1-T-MonitoringReport_track change'.				
DOE assessment				Date: 22/12/2018
From section D.3 of the revised MR it is now clear that how PP has calculated sample size and selected samples for usage survey/KPT. Hence CL02 is closed.				

CL ID	03	Section no.	Document review	Date: 03/12/2018
Description of CL				

Clarify	
a) How monitoring has ensured that the replaced low efficiency appliances are disposed off and are not used within the boundary or within the region. b) If the baseline stoves (i.e., traditional) are continued to be used, then how fuel consumption of those cook stoves are excluded in ER calculations	
Project participant response	Date: 18/12/2018
a) The PP is collecting traditional inefficient stoves from users in order to solely maintain the ICS. Currently, a discount of 33% is given for the handover of a single burner traditional stove and a 50% for the double burner traditional cookstove. These stoves are scrapped by a local scrapyard. b) An adjustment factor is applied to account for the non-use of the efficient cook stoves. In section I.6.1 of the CDM-PoA-DD-FORM it is explained that the factor μ_y is used in equation 2 to account for any continued use of pre-project devices during the year y. This parameter is monitored at least once every two years through surveys reporting if the new cookstove is being used as the main cook system and how often these stoves are used for cooking.	
Documentation provided by project participant	
The estimation of μ_y is presented in the supporting folder: '030918 Survey relevant results'. Please consult "Data", columns BY and BW.	
DOE assessment	Date: 22/12/2018
The clarification by PP is acceptable, hence CL03 is closed.	

CL ID	04	Section no.	Site visit	Date: 03/12/2018
Description of CL				
During onsite assessment, it was observed that, serial numbers were not legible in 03 cookstoves. How it is ascertained that the traceability and double counting of the stove will not be impacted. Clarify				
Project participant response				Date: 18/12/2018
Redundancy of ID elements in the distribution database assures that the stove can still be identified and ID's. The GPS point, the name of the user, the address, and the information in the selling receipts are elements that can aid in the identification.				
Documentation provided by project participant				
-				
DOE assessment				Date: 22/12/2018
The clarification PP that the "stove can still be identified and ID's. The GPS point, the name of the user, the address, and the information in the selling receipts are elements that can aid in the identification" is acceptable. The database and sales records were checked and found ok, hence CL04 is closed				

CL ID	05	Section no.	ER calculations	Date: 22/12/2018
Description of CL				
PP to clarify the cause/reason for increase in the actual GHG emission reductions achieved during the monitoring period in comparison to GHG emission reductions or net anthropogenic GHG removals estimates provided in the registered PDD.				
Project participant response				Date: 24/01/2019
To determine ex ante ER the average thermal efficiency of the 03 stove models was used, while to determine monitored ER the ER was calculated separately using the efficiency of each stove. There is the μ (greek letter) which account for the continued use of traditional stoves. Ex ante was used 0.5 while the monitored was around (0.85). The Ex ante does not consider the reduction on the number of stoves due to damages, etc.				
Documentation provided by project participant				
-				

DOE assessment	Date: 01/02/2019
The clarification by PP on increase in the actual GHG emission reductions achieved during the monitoring period in comparison to GHG emission reductions or net anthropogenic GHG removals estimates provided in the registered PDD is acceptable. The ER calculation sheets were checked and found ok, hence CL05 is closed	

Table 3. CAR from this Verification

CAR ID	01	Section no.	Document review	Date: 03/12/2018
Description of CAR				
The applied methodology "AMS-II.G, version 8.0 - Energy Efficiency Measures in Thermal Applications of Non-Renewable Biomass" is not valid, use the active version available and ensure that the monitoring parameters in the MR consistent and in line with the applied methodology (version 10.0)				
Project participant response				Date: 18/12/2018
The latest VPA-DD, is now updated with the latest available version (i.e., 10) of the AMS-II.G				
Documentation provided by project participant				
The VPA-DD and monitoring report (documents '180918_PDD_form13_VPA(ver08.1)_track change' and '180622_101.1-T-MonitoringReport_track change').				
DOE assessment				Date: 22/12/2018
The latest VPA-DD, is now updated with the latest available version (i.e., 10) of the AMS-II.G, hence CAR01 is closed				

CAR ID	02	Section no.	Document review	Date: 03/12/2018
Description of CAR				
The PP to submit the following records/documents for verification				
1) KPT reports 2) Calibration records of the weigh scales used in KPT 3) Grievance mechanism records (if any) and 4) Sustainable Development Indicators monitored				
Project participant response				Date: 18/12/2018
The documents are provided in the Supporting documents folder				
Documentation provided by project participant				
-				
DOE assessment				Date: 22/12/2018
The requested documents are submitted now, checked and found ok, Hence CAR02 is closed				

Table 4. FAR from this Verification

FAR ID	NIL	Section No.	Document review	Date: 03/09/2019
Description of FAR				
PP to clarify, if the cook stoves of more than 03 years old are not replaced and still kept in use,				
1) how the efficiency of the cook stove is ascertained and 2) how the operational cook stoves (i.e., old) will be monitored and taken into account in ER calculations				
Project participant response				Date: 03/10/2019
<i>Will be addressed during the next verification</i>				
Documentation provided by project participant				

DOE assessment	Date: DD/MM/YYYY

Appendix 5.

Data and parameters fixed ex-ante

Net calorific value of the non-renewable woody biomass that is substituted ($NCV_{biomass}$, TJ/t)	PP has selected IPCC default value i.e., 0.015 TJ/t. It is used for calculation of project emissions or actual net GHG removals by sinks, fixed at PoA level and for entire crediting period of the VPA. The verification team confirms that IPCC default value for wood fuel is 0.015 TJ/tonne can be used for net calorific value of the non-renewable woody biomass that is substituted ($NCV_{biomass}$) which is in line with the applied methodology (AMS-II.G, paragraph 11)
Emission factor for the substitution of non-renewable woody biomass by similar consumers ($EF_{projected_fossilfuel}$ tCO ₂ /TJ)	PP has selected AMS-II.G default value i.e., 63.7 tCO₂/TJ. It is used for calculation of project emissions or actual net GHG removals by sinks, fixed at PoA level and for entire crediting period of the VPA. The verification team confirms that the value of 63.7 tCO₂/TJ is to be used as emission factor for the substitution of non-renewable woody biomass by similar consumers ($EF_{projected_fossilfuel}$) is in line with the applied methodology (AMS-II.G, paragraph 11)
Quantity of woody biomass used in the absence of the project activity in tonnes per device (B_{old} , t/device/year)	PP has applied value 2.76 based on local usage survey (i.e., Baseline KPT). It is used for calculation of project emissions or actual net GHG removals by sinks, fixed at PoA level and for entire crediting period of the VPA. B_{old} will be multiplied by a net to gross adjustment factor (LAF) to account for leakages. The verification team confirms that the value applied is in accordance to paragraph 30 of the methodology, the quantity of woody biomass (B_{old}) is determined by using a default wood to charcoal conversion factor of 6 kg of firewood (wet basis) per kg of charcoal (dry basis).
Leakage adjustment factor to account for leakages (LAF, Fraction)	PP has applied AMS-II.G default value i.e., 0.95. It is used for calculation of leakage, fixed at PoA level and for entire crediting period of the VPA. The verification team confirms that the value applied is in accordance to paragraph AMS-II.G (option c of the paragraph 29). B_{old} will be multiplied by a net to gross adjustment factor to account for leakages. In this case surveys are not required.

Data and parameters monitored

Fraction of woody biomass saved by the project activity in year y that can be established as non-renewable biomass ($f_{NRB,y}$, Fraction)	PP has applied a default Country specific fraction of non-renewable woody biomass (f_{NRB}) value available on the CDM website (http://cdm.unfccc.int/DNA/fNRB/index.html) i.e., 0.91. It is used for calculation of project emissions or actual net GHG removals by sinks.
Annual quantity of woody biomass used during the project activity in tonnes per device, determined through a survey ($B_{y,new,KPT}$, t/device/year)	As the VPA includes distribution of 03 types of improved cookstoves models; a stratified random sampling approach was followed by PP and the following equation was used to calculate the sample size to achieve sample error equal or

	less than 10%: $n \geq \frac{1.645^2 NV}{(N-1) \times 0.1^2 + 1.645^2 V}$ Where: $V = \frac{SD^2}{\bar{p}^2} = \frac{\text{overall variance}}{\bar{p}^2}$ and $\bar{p}$ is the overall proportion. N Population total Number of KPT and surveys conducted according to the results of this stratification are the following: <table border="1"> <thead> <tr> <th>ICS Model</th><th>Sample visited</th></tr> </thead> <tbody> <tr> <td>Envirofit CH2200</td><td>19</td></tr> <tr> <td>Envirofit Econchar</td><td>147</td></tr> <tr> <td>Envirofit Rocketworks</td><td>38</td></tr> </tbody> </table> The verification team confirms that KPT is conducted by PP is in line with the applied methodology and registered VPA-DD. PP has applied a measured value of 3.0 t/device/year based on KPT Report. It is used for calculation of project emissions or actual net GHG removals by sinks and the KPT is conducted by trained monitoring personnel	ICS Model	Sample visited	Envirofit CH2200	19	Envirofit Econchar	147	Envirofit Rocketworks	38
ICS Model	Sample visited								
Envirofit CH2200	19								
Envirofit Econchar	147								
Envirofit Rocketworks	38								
Number of project devices of type i operating in year y ($N_{y,i}$, Number)	A total of 7,149 cook stoves were distributed in the project, which includes 4. 5,052 cook stoves of Econochar model, 5. 646 cook stoves of Envirofit CH220 model and 6. 1,451 cook stoves of Rocketworks Cha Zama model. were distributed during 2016 and 2017, out of which only 5,731 cook stoves were operational. The cook stoves can be easily tracked using cook stove IDs punched on them. Thus the verification team states that the implementation of the project matches with that mentioned in the registered PoA-DD and VPA-DD. The verification team reviewed the Project database records (Stove Selling Database & Usage survey Database) and confirms that, overall 80% of the ICS are in use in the monitoring period i.e., as per model, ➤ 82% of the Envirofit CH2200, ➤ 79% of the Envirofit Econchar, and ➤ 84% of the Rocketworks Cha Zama cook stoves are in use. It is used for calculation of project emissions or actual net GHG removals by sinks and shall remain within the limit of 180 GWh_{th} for type II CDM project activities.								

Appendix 6.

The SDGs contribution targeted are:	
SDG#1: No poverty ➤ Monitoring of Quality of employment; ➤ Savings on fuel for cooking purpose; ➤ Access to affordable and clean	Quality of employment- Mozcarbon has trained staff in stove assembly (08 people), selling (30 people) and monitoring surveys (21 people), summing 59 direct and part-time jobs created by the project. The surveyors were contracted by AVSI, an associate of Mozcarbon in Maputo. This organization payed for the legal registry of the workers status as service providers or workers cooperatives. This allows these workers to have better and easier access to the job market in the case they become dissociated with

energy;

- Number of created jobs.

the project. Mozcarbon pays the social security relative to the totality of its employees, the receipt from the National Institute of Social Security

Livelihood of the poor - The survey also accessed the users' perception of the reduction of charcoal consumption associated to the ICS usage. The reduction of charcoal consumption is associated with a reduced amount of fuel purchased in the same period of time, which translates into financial savings. Those funds can then be used in other family or personal needs, including education or business investment, generating opportunities to escape poverty.

Quantity of charcoal spent	Count	%
Decreased	233	94,3
Same amount as pre-project	1	0,4
Does not know	13	5,3
No answer	0	0,0
Total	247	100,0

94,3% of the interviewed stated a reduction in the fuel consumption. Only a marginal 0.4% declared that the ICS spent the same amount of fuel as the pre-project device. Finally, 5.3% couldn't find differences in fuel consumption rates between the pre-project and the ICS device.

Access to affordable and clean energy - The surveys show that 80% of the ICS are still in use, overall. As per model, 82% of the Envirofit CH2200, 79% of the Envirofit Econchar, and 84% of the Rocketworks Cha Zama are still in use. 97.6% of the users claim that the ICS is its main cookstove and 26.72% of the surveyed use no cooking device other than the improved charcoal cookstove.

Quantitative employment and income generation - 21 new jobs were created for the conduction of field surveys in the framework of the monitoring activities of VPA 1. These new jobs generated a positive impact not only in terms of created positions, but also in terms of future opportunities. This, given that the contracting organization, AVSI, payed for the legal registry of the workers status as service providers or workers cooperatives. This allows these workers to have better and easier access to the job market in the case they become dissociated with the project. Furthermore 08 jobs were creating in stove assembling and 30 sellers were recruited to disseminate the cookstoves across the VPA 1 area.

Training on sales - A training was organized by MozCarbon, 30 sellers were trained. The sales Management from Envirofit (represented by David Small, Managing Director of Envirofit East Africa) conducted the training in sales techniques for improved stoves, with presence of 30 young people and other stove organizations representatives from the Maputo neighbourhoods, many which are part of the current distributing partners portfolio of MozCarbon. The topics covered include: the concept of ICS, the importance of clean cooking, benefits of cookstoves, stove characteristics and technical description, sales techniques, waiver forms filling, customer education and awareness raising. The goal of this training is to improve the sales capacities, which is directly linked with the improvement of monthly incomes increase:

The verification team has reviewed the staff records & staff contracts^{21/} and accepted that quality of employment has

	improved due to the project activity leading sustainable development in the host country. The verification team has also interviewed the administrative staffs; field coordinator, field officers, and all conveyed immense satisfaction in their employment and even appreciated the support provided by their Mozacarbon Director and project consultant. The verification team has interviewed the staff employed by the PP and confirmed that the staff employed are employed by a contract by which they are free to form an association and there is no restriction on their part for collective bargaining. The contract has provision for the identity of the parties, the place of work, the title, grade, nature or category of the work for which the employee is employed or a brief description thereof, the date of commencement of the contract, the amount of paid leave to which the employee is entitled or, failing that, the procedures for allocating and determining such leave, the length of periods of notice, information regarding the salary and the frequency of its payment and working hours: daily or weekly and the collective agreements governing the conditions of employment. They are provided with sufficient holidays (5 weeks per year) with 40 working hours per week, good work place. The staffs are happy about annual increments in salary/ annual bonuses etc. One staff member conveyed to the verification team that she was proud to be associated with Mozacarbon. The verification team confirmed that labour conditions comply with national labour laws and hence accepted.																		
SDG #3: Good health and well-being ➤ Air quality monitoring	The perception of the reduction of the in-house smoke was assessed by the surveys conducted by PP. Four possible answers were proposed: decreased; same amount as pre-project, does not know, and no answer. <table><tr><th>Smoke in the kitchen</th><th>Count</th><th>%</th></tr><tr><td>Decreased</td><td>229</td><td>92,7</td></tr><tr><td>Same amount as pre-project</td><td>3</td><td>1,2</td></tr><tr><td>Does not know</td><td>15</td><td>6,1</td></tr><tr><td>No answer</td><td>0</td><td>0,0</td></tr><tr><td>Total</td><td>247</td><td>100,0</td></tr></table> 92.7% of families perceived a decreasing of the smoke in the kitchen due to the use of the ICS. This result is a direct indicator of improvement of air quality in houses, given the documented relation between smoke production and air pollution, and its impacts in human health. In this case it is possible to conclude the positive impact of the project implementation in the environmental conditions and health. The verification team, during the onsite visit, interviewed some of the project households and received positive response with regard to air quality.	Smoke in the kitchen	Count	%	Decreased	229	92,7	Same amount as pre-project	3	1,2	Does not know	15	6,1	No answer	0	0,0	Total	247	100,0
Smoke in the kitchen	Count	%																	
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Document information

Version	Date	Description
02.0	29 December 2017	Revision to align with the requirements of the "CDM validation and verification standard for programme of activities" (version 01.0).

<i>Version</i>	<i>Date</i>	<i>Description</i>
01.0	5 June 2015	Initial publication.
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