




**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)	Improved Cooking Stoves Programme of Activities in Africa UNFCCC PoA reference number: 5341	
Version number(s) of the PoA-DD(s) to which this report applies	Version 3.2	
Version number of the verification and certification report	05	
Completion date of the verification and certification report	03/02/2019	
Monitoring period number and duration of this monitoring period	Monitoring period number 04 01/01/2017 to 31/12/2017 (including both the days)	
Number and version number of the monitoring report to which this report applies	Monitoring report number: 1 Version number of the monitoring report: 4.0	
Coordinating/managing entity (CME)	Envirofit International Ltd.	
Host Parties	Host Parties of the PoA	Is this a host Party to a CPA covered in this report? (yes/no)
	Kenya	Yes
	South Africa	No
Applied methodologies and standardized baselines	AMS II.G., version03, "Energy efficiency measures in thermal applications of non-renewable biomass"	
Mandatory sectoral scopes linked to the applied methodologies	3: Energy demand	
Conditional sectoral scopes linked to the applied methodologies, if applicable	Not applicable	
Estimated amount of GHG emission reductions or GHG removals for this monitoring period in the included CPAs covered in this report	5341-0001 GHG emission reductions: 13,356 tCO ₂ e 5341-0002 GHG emission reductions: 43,063 tCO ₂ e 5341-0003 GHG emission reductions: 42,811 tCO ₂ e 5341-0004 GHG emission reductions: 43,384 tCO ₂ e 5341-0005 GHG emission reductions: 6,906 tCO ₂ e 5341-0006 GHG emission reductions: 6,906 tCO ₂ e 5341-0007 GHG emission reductions: 6,906 tCO ₂ e Total: :163,532 tCO₂e	
Certified amount of GHG emission reductions or GHG removals for this monitoring period for the included CPAs covered in this report	5341-0001 GHG emission reductions: 0 tCO ₂ e 5341-0002 GHG emission reductions: 28,072 tCO ₂ e 5341-0003 GHG emission reductions: 37,166 tCO ₂ e 5341-0004 GHG emission reductions: 34,725 tCO ₂ e 5341-0005 GHG emission reductions: 0 tCO ₂ e 5341-0006 GHG emission reductions: 0 tCO ₂ e 5341-0007 GHG emission reductions: 0 tCO ₂ e Total: : 99,963 tCO₂e	
Name and UNFCCC reference number of the DOE	Carbon Check (India) Private Ltd. E-0052	
Name, position and signature of the approver of the verification and certification report	Vikash Kumar Singh, Compliance Officer 	

SECTION A. Executive summary

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Introduction:

The Co-ordinating Managing Entity/Project Participant has commissioned the DOE, Carbon Check (India) Private Ltd. to perform an independent verification of the CDM Programme of Activities “Improved Cooking Stoves Programme of Activities in Africa” in Kenya and South Africa (hereafter referred to as “Programme of Activities or PoA”) for the CPAs titled “Improved Cooking Stoves Programme of Activities in Africa – CPA No. 00001 (Kenya)”; “Improved Cooking Stoves Programme of Activities in Africa – CPA No. 00002 (Kenya)”; “Improved Cooking Stoves Programme of Activities in Africa – CPA No. 00003 (Kenya)”; “Improved Cooking Stoves Programme of Activities in Africa – CPA No. 00004 (Kenya)”; “Improved Cooking Stoves Programme of Activities in Africa – CPA No. 00005 (Kenya)”; “Improved Cooking Stoves Programme of Activities in Africa – CPA No. 00006 (Kenya)” and “Improved Cooking Stoves Programme of Activities in Africa – CPA No. 00007 (Kenya)”. The PoA involves replacement of less efficient cooking stoves using woody biomass (wood-fuel and/or charcoal) with improved cooking stoves (ICS) which are more efficient. The ICS distributed under CPAs of the PoA are more efficient in transferring heat from the fuel to the pot when compared to the stoves typically used in baseline. By replacing inefficient stoves, the PoA will save on consumption of woody biomass (either wood or charcoal made of wood).

During the current monitoring period, the CPAs 5341-0002, 5341-0003 and 5341-0004 were only implemented and the CPAs 5341-0001, 5341-0005, 5341-0006 and 5341-0007 were not implemented. Hence during the current monitoring period, emission reductions are being claimed only for CPAs 5341-0002, 5341-0003 and 5341-0004. The CPAs are designed to generate emission reductions by distribution of the fuel-efficient charcoal stoves for 5341-0002; fuel wood stoves for 5341-0003 and charcoal / fuel wood based cook stoves for 5341-0004 in Kenya. The fuel-efficient cook stoves are replacing the less efficient baseline stoves in common use (baseline scenario). The CME and CPA implementer are responsible for the collection of data in accordance with the monitoring plan and the reporting of GHG emissions reductions from the component project activities.

This report summarises the findings of the verification of the project, performed on the basis of paragraph 62 of the CDM Modalities & Procedures, as well as criteria given to provide for consistent project operations, monitoring and reporting and the subsequent decisions by the CDM Executive Board. Verification is required for all registered CDM project activities intending to confirm their achieved emission reductions and proceed with request for issuance of CERs. This report contains the findings and resolutions from the verification and a certification statement for the certified emission reductions.

Objective:

Verification is the periodic independent review and ex-post determination of both quantitative and qualitative information by a Designated Operational Entity (DOE) of the monitored reductions in GHG emissions that have occurred as a result of the registered CDM project activity during a defined monitoring period.

Certification is the written assurance by a DOE that, during a specific period in time, a project activity achieved the emission reductions as verified.

The objective of this verification was to verify and certify emission reductions reported for the “Improved Cooking Stoves Programme of Activities in Africa” in the host country “Kenya” for the period 01/01/2017 to 31/12/2017.

The purpose of verification is to review the monitoring results and verify that the monitoring methodology was implemented according to the monitoring plan and monitoring data, and used to

confirm the reductions in anthropogenic emissions by sources, is sufficient, definitive and presented in a concise and transparent manner. CCIPL's objective is to perform a thorough, independent assessment of the registered programme of activities.

In particular, the monitoring plan, monitoring report and the project's compliance with relevant UNFCCC and host Party criteria are verified in order to confirm that the component project/s has/have been implemented in accordance with the previously registered/included component project design and conservative assumptions, as documented. It is also confirmed if the monitoring plan is in compliance with the registered/included CPA-DDs and the approved monitoring methodology.

Scope:

The scope of the verification is:

- To verify the project implementation and operation with respect to the registered/included CPA-DD or approved revised CPA-DD
- To verify the implemented monitoring plan with the registered/included CPA-DD or approved revised CPA-DD and applied baseline and monitoring methodology.
- To verify that the actual monitoring systems and procedures are in compliance with the monitoring systems and procedures described in the monitoring plan.
- To evaluate the GHG emission reduction data and express a conclusion with a reasonable level of assurance about whether the reported GHG emission reduction data is free from material misstatement.
- To verify that reported GHG emission data is sufficiently supported by evidence.

The verification shall ensure that the reported emission reductions are complete and accurate in order to be certified.

The verification comprises a review of the monitoring report covering the monitoring period from 01/01/2017 to 31/12/2017 and based on the registered/included CPA-DDs including the monitoring plan, emission reduction calculation spreadsheet, monitoring methodology and all related evidence provided by project participant.

On-site visit and stakeholders' interviews are also performed as part of the verification process.

The verification team assigned by the DOE concludes that the PoA-DD (Version 3.2, dated 27/11/2012) /B04/, CPAs 5341-0002, 5341-0003 and 5341-0004, as described in the registered CPA-DDs Version 2.0 date 11/10/2013, Version 2.1 dated 18/10/2013 and Version 1.0, dated 27/01/2014 respectively /B04/ and the Monitoring report, Version 4.0, dated 02/02/2019 /2/), meets all relevant requirements of the UNFCCC for CDM project activities including article 12 of the Kyoto Protocol and paragraph 62 of CDM M& P, the modalities and procedures for CDM (Marrakesh Accords) and the subsequent decisions by the COP/MOP and CDM Executive Board. The verification has been conducted in-line with the CDM VVS for PoAs requirements Version 01.0 /B01-1/.

The component project activities were correctly implemented according to selected monitoring methodology, monitoring plan and the registered/included CPA DD/s. The monitoring system was installed, maintained in a proper manner, while collected monitoring data allowed for the verification of the amount of achieved GHG emission reductions. Through the review and on site visit the verification team confirms that the PoA has resulted in the 99,963 tCO₂e emission reductions during the fourth monitoring period.

CC IPL, as a DOE, is therefore pleased to issue a positive verification opinion expressed in the attached Certification statement.

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/ Technical Expert	IR	Anand	Amit	CC IPL	X	X	X	X
2.	Team Member	IR	Agarwalla	Sanjay Kumar	CC IPL	X			X
3.	Local Expert	EI	Muriuki	Job N	EI		X	X	

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	Singh	Vikash Kumar	CC IPL
2.	Approver	IR	Singh	Vikash Kumar	CC IPL

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.	Human Error: Recording and reporting of the information in the ER spreadsheet.	Medium	All the ER spreadsheet data of the stoves, including sales database, determination of parameter for efficiency testing including data calculation. This includes all the parameters to be monitored ex-post as per the PoA-DD/CPA-DDs/B04/.	The risk was mitigated by the training of the personnel involved in the data capture, calculation and by following the monitoring responsibilities. The training records were reviewed which was also confirmed during the on-site visit interviews. Verification team, based on the above, confirms that the risk is appropriately mitigated.
2.	Information System: Use of spreadsheets without adequate controls related to data changes/updates, version tracking, traceability, security	Medium	The data is recorded in the spreadsheets based on the raw data collected during the field visits. The access to the spreadsheets for calculation of ERs, monitoring and sales database and Stove efficiency testing records.	The identified risk was mitigated by managing access to the records. It was confirmed through interviews that the raw data is collected by the field personnel and then transmitted and stored electronically to the CME's office. The data quality control is maintained by the CME.

3.	<i>Accuracy of the measuring equipment</i>	<i>Low</i>	<i>Check the calibration records for the measurement equipment used for efficiency test.</i>	<i>The risk due to accuracy of the measuring equipment was ensured by planning to check calibration certificates of the measuring equipment used for stove efficiency (water boiling tests).</i>
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C.2. Consideration of materiality in conducting the verification

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The threshold of materiality was evaluated based on §13 of “Guideline: Application of materiality in verifications” Version 02.0 /B08/ and § 307 of CDM VVS for PoAs, version 01.0/B01-1/. It was concluded that the materiality threshold applicable to the project activity based on actual emission reductions achieved is 5% of 99,963 tCO₂e which is equal to 4,998 tCO₂e.

In planning the verification, verification team took cognizance of para 11 and 12 of the “Guideline: Application of materiality in verifications” Version 02.0 /B08/. A materiality threshold of 4,998 tCO₂e is determined in line with para 307 (d) of CDM VVS for PoAs, version 01.0.

Based on the above, activities in which risks were assessed were:

1. Monitoring system including the data input procedure (including relevant personnel and applicable template forms used)
2. Copy of the agreement between household and Project Participant (s) (origin of data)
3. Stove unique ID system
4. ER sheet (application of data)
5. Data flow
6. Data control procedures
7. Stove efficiency test (WBT) records

In conducting the verification, DOE took cognizance of para 13-17 of the “Guideline: Application of materiality in verifications” Version 02.0 /B08/ and based on the input of data from different sources checked through sampling of records during on-site and off-site. Data flow was checked through comparison of data in hand written forms /5/, electronic database and ER sheet /4/. The competence of the personnel involved in conducting the stove efficiency testing, recording of data and calculation of the emission reductions data has been checked by the verification team by means of on-site visit interviews.

The risks identified can be mitigated through cross check with all sets of documents. The verification team performed the following checks in order to mitigate the effects of the above-identified sources of error:

Mitigation of Human error risks: The verification team mitigated the risk by checking the training records of the personnel and during the on-site visit interviews. Further, data was crosschecked with the ER calculation spreadsheet /4/ and the raw data.

Mitigation due to error in Information system: Verification team by conducting interviews with the personnel responsible for such activities mitigated the risk due to error in information system. It was confirmed through interviews that the raw data is collected by the field personnel and then transmitted and stored electronically at CME’s office. The data quality control is maintained by the CME.

Accuracy of the measuring equipment: The risk due to inaccuracy in measurements was mitigated by reviewing calibration certificates of all the project equipment.

As no material errors, omissions or misstatements could be found, a reasonable level of assurance is achieved.

SECTION D. Means of verification**D.1. Desk/document review**

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The verification was performed primarily based on the review of the Monitoring report /1/ and the supporting documentation. This process included review of data and information presented to verify their completeness and review of the monitoring plan /B04/ and monitoring methodology /B02/. Documents reviewed or referenced during the verification are listed in Appendix 3 below.

D.2. On-site inspection

Duration of on-site inspection: 21/07/2018 to 22/07/2018				
No.	Activity performed on-site	Site location	Date	Team member
1.	An assessment of the implementation and operation of the registered project activity as per the registered PoA-DD/B04/, registered/included CPA-DDs/B04/.	Kenya	21/07/2018 to 22/07/2018	Amit Anand Job N Muriuki
2.	A review of information flows for generating, aggregating and reporting the monitoring parameters	Kenya	21/07/2018 to 22/07/2018	Amit Anand Job N Muriuki
3.	Interviews with relevant personnel to determine whether the operational and data collection procedures are implemented in accordance with the monitoring plan in the CPA-DDs/B04/	Kenya	21/07/2018 to 22/07/2018	Amit Anand Job N Muriuki
4.	A cross check between information provided in the monitoring report and data from other sources such as plant logbooks, inventories, purchase records or similar data sources	Kenya	21/07/2018 to 22/07/2018	Amit Anand Job N Muriuki
5.	A check of the monitoring equipment including calibration performance and observations of monitoring practices against the requirements of the CPA-DDs/B04/ and the selected methodology and corresponding tool(s), where applicable	Kenya	21/07/2018 to 22/07/2018	Amit Anand Job N Muriuki
6.	A review of calculations and assumptions made in determining the GHG data and emission reductions	Kenya	21/07/2018 to 22/07/2018	Amit Anand Job N Muriuki
7.	An identification of quality control and quality assurance procedures in place to prevent or identify and correct any errors or omissions in the reported monitoring parameters	Kenya	21/07/2018 to 22/07/2018	Amit Anand Job N Muriuki

D.3. Interviews

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			

1.	Njuguna	Peter K	Envirofit	21/07/2018 to 22/07/2018	Project implementation and operation, monitoring procedure, data and information flow, Roles and responsibility, Quality Assurance – Management and operating system, Sales/Distribution records, Survey records, WBT, Qualification and Training	Amit Anand, Job N Muriuki
2.	Kabue	Boniface	Envirofit	21/07/2018 to 22/07/2018	Sales/Distribution records, Survey records	Amit Anand, Job N Muriuki
3.	Lohia	Rohit	Envirofit	23/07/2018 (through skype)	Project operation, CER calculation and completeness of monitoring report, Quality Assurance – Management and operating system, compliance of monitoring plan with monitoring methodology and registered CPA-DDs.	Amit Anand

D.4. Sampling approach

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As assessed in above sections, emission reductions for only three implemented CPAs, 5341-0002, 5341-0003 and 5341-0004, are being claimed for this monitoring period and the total population of the stoves under these three CPAs are 23,965, 17,754 and 24,727 respectively.

The four monitoring parameters required to be monitored through the sampling plan are:

1. The thermal efficiency of the ICS distributed (%) (η_{new})
2. The Stove Operating Fraction, i.e. the fraction of users using the ICS (SOF)
3. The fraction of stove users still using baseline (replaced) stoves (f_{old})
4. The amount of woody biomass that continues to be used in the baseline stoves (kg) (μ_{old})

Simple random sampling was applied by CME for selection of the monitoring samples with 95/10 confidence/precision for cross-CPA sampling for all the four parameters which is deemed acceptable as per the registered PoA DD / CPA DDs. Two sampling frames were applied for determining the parameters “SOF”, “ f_{old} ” and “ μ_{old} ” for the two different types of fuels used in the stoves (charcoal and wood fuel). Within the same fuel type, the stoves were considered homogeneous as they were distributed in the same country (Kenya), end users were households only and the efficiency of the different stove models distributed under the three CPAs did not differ by more than +/-10%. For the thermal efficiency of the stoves (η_{new}) sampling frames were chosen for the respective 6 models of stoves distributed and considered for monitoring (CH2200, CH 4400,

CH5200, CH5300, ECCL and M5000) separately. Please refer to the section E.3.4.3 of this report on detailed assessment on sampling plan opted by the CME.

As per paragraph 24 of the Sampling Standard, version 07 /B07/, the verification team has to verify whether the project participants or the coordinating/managing entity have implemented the sampling and surveys according to the sampling plan in the registered monitoring plan. The verification includes determining:

- (a) Whether the required confidence/precision has been met;
- (b) Whether the selected sample was representative of the population.

In line with paragraph 25 of the Sampling Standard, the verification team has applied a sampling approach for on-site visits as part of verification. Now as the CME had applied sampling approach, the verification team has chosen acceptance sampling in accordance with paragraph 27 of the sampling standard /B07/.

DOE used sampling during verification for checking the operational status and to check if the WBT tests have been done in the households and it was confirmed that the WBT tests were conducted in their households. A sample size of 22 households (11 for each of the two sampling frames i.e. charcoal and wood fuel fired stoves) was chosen (with no discrepant records). A sample size of 11 was required, based on an AQL of 0.5% and UQL of 20 %, the producer and consumer risk used was 10 % each. Acceptance number (c) thus determined for the samples is 0. It was observed that out of the 22 samples, all the 22 stoves were found to be operational which matched with the CME's records and hence no discrepant records were observed with the MR /2/ and ER sheet /4/ and thus c=0. Thus, CME's set of records has been accepted in line with § 32 of the sampling standard, version 07 /B07/. For SOF, f_{old} and μ_{old} parameters a common interview questionnaire was prepared and was used during the survey by the CME. Verification team has cross verified these sample documents during the on-site visit.

The sampling plan implemented by the CME is in accordance with the applied approved monitoring methodology /B02/ and the PoA-DD/CPA-DDs /B04/. The CME has appropriately performed Simple Random Sampling procedure in line with the applied methodology. As the registered PoA-DD /B04/ mentions the option for Simple Random Sampling procedure, it is acceptable to the verification team.

The necessary confidence / precision of 95/10 each of the parameters is met. This has been cross verified by the verification team from the supporting documents submitted /4/.

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
General			
Compliance of the monitoring report with the monitoring report form	00	00	00
Remaining forward action requests from validation and/or previous verification	00	00	00
CPA(s) considered for verification and covered in this report	00	01	00
Programme of activities			
Compliance of the programme implementation with the registered PoA-DD	00	00	00
Implementation and operation of the management system	00	00	00
Post-registration changes	00	00	00
<ul style="list-style-type: none"> Temporary deviations from the registered monitoring plan, applied methodology or applied standardized baseline 	00	00	00
<ul style="list-style-type: none"> Corrections 	00	00	00
<ul style="list-style-type: none"> Inclusion of a monitoring plan 	00	00	00

• Permanent changes to the registered monitoring plan or permanent deviation of monitoring from the applied methodology, standardized baseline or other applied standards or tools	00	00	00
• Changes to the programme design or project design	00	00	00
• Change of coordinating/managing entity	00	00	00
• Changes specific to afforestation and reforestation activities	00	00	00
Component project activities			
Compliance of the CPA implementation with the included CPA design document	02	00	00
Post-registration changes	00	00	00
• Temporary deviations from registered monitoring plan, applied methodology or applied standardized baseline	00	00	00
• Corrections	00	00	00
• Changes to the start date of the crediting period of component project activities	00	00	00
• Inclusion of a monitoring plan	00	00	00
• Permanent changes to the registered monitoring plan or permanent deviation of monitoring from the applied methodology, standardized baseline or other applied standards or tools	00	00	00
• Changes to the programme design of project design	00	00	00
• Changes specific to afforestation and reforestation component project activities	00	00	00
Compliance of the registered monitoring plan with the methodology including applicable tool(s) and standardized baseline	00	00	00
Compliance of monitoring activities with the registered monitoring plan	00	00	00
• Data and parameters fixed ex ante or at renewal of crediting period	00	00	00
• Data and parameters monitored	01	01	
• Implementation of sampling plan	00	00	00
Compliance with the calibration frequency requirements for measuring instruments	00	00	00
Assessment of data and calculation of emission reductions or net removals	-	-	-
• Calculation of baseline GHG emissions or baseline net GHG removals by sinks	00	00	00
• Calculation of project GHG emissions or actual net GHG removals by sinks	00	00	00
• Calculation of leakage GHG emissions	00	00	00
• Summary of calculation of GHG emission reductions or net GHG removals by sinks	00	00	00
• Comparison of actual GHG emission reductions or net GHG removals by sinks with estimates in included CPA	00	00	00
• Remarks on difference from estimated value in included CPA	00	00	00
Assessment of reported sustainable development co-benefits	00	00	00
Global stakeholder consultation	00	00	00
Others (please specify) UNFCCC I & R queries / Review comment	00	03	02
Total	03	05	02

SECTION E. Verification findings**E.1. General****E.1.1. Compliance of the monitoring report with the monitoring report form**

Means of verification	Document Review
Findings	-
Conclusion	<p>CME has used the Monitoring report form for CDM programme of activities, Version 02.0 /B03/. Verification team confirms that the latest available version of monitoring report template /B03/ has been used by the CME and the MR is in compliance of the monitoring report form and instructions therein /B03/.</p> <p>CC IPL, had made the version 1.0, dated 12/06/2018 of the monitoring report /1/, covering the monitoring period from 01/01/2017 to 31/12/2017 (both days inclusive) publicly available on 19/06/2018.</p> <p>This confirms compliance with the §337 and §338 of CDM VVS for PoAs, version 01.0 /B01-1/.</p>

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

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There are no forward action requests from validation and/or the previous (third) verification of the PoA.

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)
Improved Cooking Stoves Programme of Activities in Africa – CPA No. 00001 (Kenya) 5341-0001	Yes	06/12/2012	Version 3.2	Y
Improved Cooking Stoves Programme of Activities in Africa – CPA No. 00002 (Kenya) 5341-0002	Yes	29/10/2013		Y
Improved Cooking Stoves Programme of Activities in Africa – CPA No. 00003 (Kenya) 5341-0003	Yes	06/11/2013		Y
Improved Cooking Stoves Programme of Activities in Africa – CPA No. 00004 (Kenya) 5341-0004	Yes	24/03/2014		Y

Improved Cooking Stoves Programme of Activities in Africa – CPA No. 00005 (Kenya) 5341-0005	Yes	06/11/2017		N
Improved Cooking Stoves Programme of Activities in Africa – CPA No. 00006 (Kenya) 5341-0006	Yes	06/11/2017		N
Improved Cooking Stoves Programme of Activities in Africa – CPA No. 00007 (Kenya) 5341-0007	Yes	06/11/2017		N

CAR 01 had been raised and satisfactorily closed. Please refer to Appendix 4 for further details.

E.2. Programme of activities

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

Means of verification	Document Review, Interview
Findings	-
Conclusion	<p>CC IPL by means of an on-site inspection and document review, assessed that all physical features (technology, project equipment, and monitoring and metering equipment) of the included CPAs in the registered PoA-DD are in place and that the coordinating/managing entity has operated the PoA and the CPAs as per the registered PoA-DD and the CPA-DDs.</p> <p>There are no deviations or proposed or actual changes in the implementation or operation of the PoA and the included CPAs.</p> <p>The verification team confirms actual operation of the CPAs and PoA implementation and operation in compliance with the registered PoA-DD / CPA-DDs in order to confirm the compliance of § 339, § 340 and § 341 of CDM VVS for PoAs, Version 01.0 /B01-1/.</p>

E.2.2. Implementation and operation of the management system

Means of verification	Document Review, Interview
Findings	-
Conclusion	<p>The PoA management system including the record-keeping system has been explained in the registered PoA-DD /B04/. During the course of verification, verification team based on review of provided documents and OSV interview/observation has assessed this management system. Verification team evaluated the management systems in place to implement the monitoring of the project activity. This included the roles and responsibilities, data collection, transfer and aggregation procedures, data storage and archiving for the monitoring system.</p> <p>As outlined in section D.7.2 of CPA-DDs /B04/ and section D of MR, monitoring is done by the CPA implementer, Envirofit Kenya Limited (DO) by means of sales database. The data is further periodically checked by the CME to ensure there is no double counting. The records of sales database /6/ have been verified during the course of verification.</p> <p>In order to ensure completeness and accuracy of monitoring information, electronic database is operated and maintained by the DO. This information is further maintained by the CME, who verifies the reported sales with the number of stoves</p>

	<p>produced by the manufacturer. Since the unique code inscribed on the cook stoves will correspond to its CPA, the occurrence of double counting is avoided. This provision for the avoidance of double counting as outlined in the PoA management system has been verified by means of review records of sales database /6/ and OSV interview/observation during the course of verification. This unique serial numbering system and the data from manufacturer were further cross-checked (on a sampling basis) during the site visit physical inspection.</p> <p>It was confirmed during the OSV and by checking the monitoring system that all the roles and responsibilities related to monitoring are fulfilled by representatives of CME and the CPA implementer.</p> <p>The responsibilities and authorities for monitoring and reporting are in accordance with the responsibilities and authorities stated in the monitoring plan /B04/.</p> <p>The details about monitoring system have been provided in Section D of the monitoring report /2/. The data flow and management and reporting structure was also checked during the on-site visit.</p> <p>The verification team confirms that the monitoring management system of the CDM PoA is in place, with the responsibilities properly identified and in place. This confirms the compliance of § 339 (a), § 346 (b) (iv) and § 346 of CDM VVS PoAs. Version 01.0 /B01-1/.</p>
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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 are no temporary deviations from the registered monitoring plan, monitoring methodology or standardized baseline during the monitoring period.

E.2.3.2. Corrections

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There are no corrections applicable to the monitoring period that have been approved by the Board during this monitoring period or to be submitted with the request for issuance.

E.2.3.3. Inclusion of a monitoring plan

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There are no inclusions of monitoring plan to the registered programme of activities has been approved by the Board during this monitoring period

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 are no permanent changes to the registered monitoring plan or permanent deviation of the monitoring from the applied methodology during the current monitoring period.

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

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There are no changes to the programme design of the registered PoA-DD (including corresponding changes to project design of the generic CPA-DD(s)) and updates to the eligibility criteria for inclusion of specific-case CPAs in the PoA.

E.2.3.6. Change of coordination/managing entity

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Not applicable

E.2.3.7. Changes specific to afforestation and reforestation activities

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Not applicable to the type of the programme of activity.

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

Means of verification	Document Review, Interview	
Findings	CL 01 and CL 02 have been raised and satisfactorily closed. Please refer to Appendix 4 for further details.	
Conclusion	The implementation status of the PoA and the component project activities is:	
	Co-ordinating and Managing entity/Project Participants:	Envirofit International Ltd.
	Title of the PoA:	Improved Cooking Stoves Programme of Activities in Africa
	UNFCCC registration No:	PoA - 5341
	Applied Baseline and monitoring methodology:	AMS-II.G, Version 03
	Title of the CPA:	Improved Cooking Stoves Programme of Activities in Africa – CPA No. 00001 (Kenya)
	CPA reference number:	5341-0001
	Date of inclusion:	06/12/2012
	CPA start of operation:	Not implemented during the reported monitoring period
	CPA implementer	East Africa Energy Limited
	Project Scale:	Small scale
	Location of the CPA:	Kenya
	CPA crediting period:	15/12/2012 to 14/12/2022
	Reported monitoring Period verified in this verification:	01/01/2017 to 31/12/2017
	Title of the CPA:	Improved Cooking Stoves Programme of Activities in Africa – CPA No. 00002 (Kenya)
	CPA reference number:	5341-0002
	Date of inclusion:	29/10/2013
	CPA start of operation:	Sale/Distribution of stoves – 16/03/2012 /6/
	CPA implementer	Envirofit Kenya Limited
	Project Scale:	Small scale
	Location of the CPA:	Kenya
	CPA crediting period:	01/01/2014 to 31/12/2023
	Reported monitoring Period verified in this verification:	01/01/2017 to 31/12/2017
	Title of the CPA:	Improved Cooking Stoves Programme of Activities in Africa – CPA No. 00003 (Kenya)
	CPA reference number:	5341-0003
	Date of inclusion:	06/11/2013
	CPA start of operation:	Sale/Distribution of stoves – 03/04/2015 /6/
	CPA implementer	Envirofit Kenya Limited
	Project Scale:	Small scale
	Location of the CPA:	Kenya
	CPA crediting period:	01/01/2014 to 31/12/2023
	Reported monitoring Period verified in this verification:	01/01/2017 to 31/12/2017

Title of the CPA:	Improved Cooking Stoves Programme of Activities in Africa – CPA No. 00004 (Kenya)
CPA reference number:	5341-0004
Date of inclusion:	24/03/2014
CPA start of operation:	Sale/Distribution of stoves – 08/04/2012
CPA implementer	Envirofit Kenya Limited
Project Scale:	Small scale
Location of the CPA:	Kenya
CPA crediting period:	01/04/2014 to 31/03/2024
Reported monitoring Period verified in this verification:	01/01/2017 to 31/12/2017

Title of the CPA:	Improved Cooking Stoves Programme of Activities in Africa – CPA No. 00005 (Kenya)
CPA reference number:	5341-0005
Date of inclusion:	06/11/2017
CPA start of operation:	Not yet implemented
CPA implementer	Envirofit Kenya Limited
Project Scale:	Small scale
Location of the CPA:	Kenya
CPA crediting period:	06/11/2017 to 05/11/2027
Reported monitoring Period verified in this verification:	06/11/2017 to 31/12/2017

Title of the CPA:	Improved Cooking Stoves Programme of Activities in Africa – CPA No. 00006 (Kenya)
CPA reference number:	5341-0006
Date of inclusion:	06/11/2017
CPA start of operation:	Not yet implemented
CPA implementer	Envirofit Kenya Limited
Project Scale:	Small scale
Location of the CPA:	Kenya
CPA crediting period:	06/11/2017 to 05/11/2027
Reported monitoring Period verified in this verification:	06/11/2017 to 31/12/2017

Title of the CPA:	Improved Cooking Stoves Programme of Activities in Africa – CPA No. 00007 (Kenya)
CPA reference number:	5341-0007
Date of inclusion:	06/11/2017
CPA start of operation:	Not yet implemented
CPA implementer	Envirofit Kenya Limited
Project Scale:	Small scale
Location of the CPA:	Kenya
CPA crediting period:	06/11/2017 to 05/11/2027
Reported monitoring Period verified in this verification:	06/11/2017 to 31/12/2017

During the reported monitoring period, only 5341-0002, 5341-0003 and 5341-0004 were implemented and hence only these three CPAs were monitored as there were no stoves distributed in 5341-0001, 5341-0005, 5341-0006 and 5341-0007. No emission reductions are being claimed by the CME for 5341-0001, 5341-0005, 5341-0006 and 5341-0007. As a part of the site visit, the verification team was able to confirm that the Programme of activities and the component project activities' implementation are in accordance with the project description contained in the included CPA-DDs for 5341-0002, 5341-0003 and 5341-0004 /B04/.

The CPAs 5341-0002, 5341-0003 and 5341-0004 include distribution of energy efficient improved cooking stoves. The CPA implementer is Envirofit Kenya Limited. The portable improved cook stoves (ICS) under the CPAs use charcoal / wood-fuel /7/ as fuel. These ICSs are efficient in transferring heat from the fuel to the pot, thus saving charcoal / wood fuel compared to the traditional charcoal stoves used by the Kenyan households.

The number of stoves deployed under each CPA has been confirmed by the monitoring database /6/. It was confirmed through the monitoring database /6/ that the CPA involves distribution and installation of 23,965¹, 17,754 and 24,727 stoves for 5341-0002, 5341-0003 and 5341-0004 CPAs respectively till the end of the monitoring period.

The annual energy savings in GWh_{th} for the three CPAs for the monitoring period were as follows:

CPA	GWh _{th}	Comment
CPA 2	103.87	Less than the CPA-DD requirement of 180 GWh _{th} for small scale project
CPA 3	137.52	Less than the CPA-DD requirement of 180 GWh _{th} for small scale project
CPA 4	128.49	Less than the CPA-DD requirement of 180 GWh _{th} for small scale project

It was confirmed during the OSV that Envirofit International Ltd. is the Coordinating/Managing Entity for the PoA. The actual component project activity/ies are in line with the registered/included CPA-DDs /B04/. Envirofit International Kenya is the CPA implementers for the CPAs.

The information (including data and variables) provided in the MR /2/ is in line with the details provided in the included/registered CPA-DDs /B04/.

The monitoring report /2/, reports for the fourth monitoring period (01/01/2017 - 31/12/2017) for all the included CPAs in the PoA and thus is the only batch applicable for the monitoring period. The reported monitoring report is a consecutive batch to be reported after the third monitoring period and is after the end date of the third monitoring period (01/01/2016 – 31/12/2016).

CCIPL's verification team considers the project description of the project contained in the registered PoA-DD and the CPA-DDs /B04/ to be complete and accurate. The CPA-DDs comply with the relevant methodology, tools, forms and guidance at the time of CPA-DDs submission for registration/inclusion.

In accordance with § 341 of CDM VVS for PoA, version 01 /B01-1/, the verification team confirms that there is no information (data and variables) in the current monitoring period that are different from that stated in the registered CPA-DDs which has caused an increase in the estimates of GHG emission reductions.

Verification team has assessed the project in order to check any proposed or actual changes to the project design in accordance with § 269 of CDM VVS for PoAs, Version 01.0. In the opinion of CCIPL, there is no change to the project design. CCIPL's verification team confirms that the CPAs are implemented within the boundary of the PoA as described in the registered PoA-DD.

In accordance with § 341 (c) of CDM VVS for PoAs, Version 01.0 /B01-1/, information (data and variables) provided in the monitoring report that are different from that stated in the registered CPA-DDs /B04/, have been assessed. The assessment is summarized below:

¹ In CPA 2, although the total number of stoves distributed is 27,704, but CME is claiming emission reductions for only 23,965 stoves (and not claiming any emission reductions for 3,739 stoves of model CH6600)

	Parameter	Ex-ante value in the CPA-DDs	Actual operation for the reported monitoring period	Assessment by the verification team
	Number of cook-stoves (N_{all})	CPA2- 18,500; CPA3- 16,000; CPA4- 17,500;	CPA2- 23,173; CPA3- 16,334; CPA4- 11,509(Charcoal) 11,799(Wood)	<p>Verification team noted that the actual number of cook-stoves distributed under the CPAs is higher than the number indicated in the registered CPA-DDs /B04/. This difference is acceptable based on the following:</p> <ul style="list-style-type: none"> • CPA-DDs do not restrict the number of cook stoves as the stated values are just indicative values (as explained below); • Energy savings in the CPAs during the monitoring period is less than the threshold limit of 180 GWh_{th}/year for small scale project activities. <p>Verification team further noted that the cook-stove numbers as indicated in the registered CPA-DDs is not a fixed number (thus this cannot be categorized under a design change) and this assessment has been based on review of following paragraphs of CPA DD:</p> <p><i>“The CPA will have a maximum energy saving of less than or equal to 180 GWh_{th}/year thus staying within the small-scale threshold. Based on the estimated energy savings, it is envisaged that about 18,500 stoves will be distributed under the CPA” (Refer Section A.3, of the registered CPA-DD, Version 2.0 dated 11/10/2013) /B04/.</i></p> <p>The number of cook-stoves stated in the CPA-DDs is only an indicative number based</p>

				on the small scale annual energy saving threshold of 180GWh _{th} /year. The verification team noted that with the increase in number of stoves, the CPAs still remain under the limit of small scale and hence this is not deemed as any design change.
	Efficiency of the ICS (η_{new})	CPA2- 36.5%; CPA3- 29.5%; CPA4- 34.3%;	CPA2- 29.05%; CPA3- 28.46%; CPA4- 29.92%(Charcoal) 28.46% (Wood)	The weighted average efficiency of the cook-stoves (η_{new}) monitored ex-post for the current monitoring period is less than the estimated ex-ante values in the CPA-DDs. Verification team based on its sectoral expertise confirms that decrease in efficiency in actual project condition is a realistic condition and thus this issue does not require further assessment, as it does not lead to increase in emission reductions.
	Stove Operation Fraction (SOF)	0.95 (for all the three CPAs)	0.884 (Charcoal) 0.900 (Wood)	The monitored ex-post value of SOF for the current monitoring period are not higher than the ex-ante estimated values and are the actual monitored values during the current monitoring period and hence deemed acceptable.
	The amount of woody biomass consumption that is consumed through the continued use of old stoves (μ_{old})	CPA2- 177.9 kg/year; CPA3- 208.8 kg/year; CPA4- 189.48 kg/year;	0 kg/year (charcoal); 1,310 kg/year (wood)	The amount of woody biomass consumption that is consumed through the continued use of old stoves is based on the actual monitored ex-post value for the current monitoring period. It is noted that for the charcoal stoves the value is 0 as there were no stoves found to be using baseline stove along with the project stove in the selected survey samples. For the wood stoves the value is more than the ex-ante estimated ex-ante value in the CPA-DDs. As the values are based on the

				actual monitored values as verified during the on site visit and survey records, this is deemed acceptable to the verification team.
	The fraction of end users that are still using baseline (replaced) stoves (f_{old})	0.1	0 (charcoal); 0.144 (wood)	As explained above, it is noted that for the charcoal stoves the value is 0 as there were no stoves found to be using baseline stove along with the project stove in the selected survey samples. For the wood stoves the value is more than the ex-ante estimated ex-ante value in the CPA-DDs. As the values are based on the actual monitored values as verified during the on site visit and survey records, this is deemed acceptable to the verification team.
	Calculated average stove operation years in the monitoring period ($Stove_{year}$)	1	CPA2- 0.65; CPA3- 0.91; CPA4- 0.51 (Charcoal) 0.80 (Wood)	$Stove_{year}$ monitored ex-post for the current monitoring period are either equal to or less than the estimated ex-ante value in the CPA-DDs which is deemed acceptable.
	Emission reductions per stove/year (tCO_2)	CPA2- 2.33; CPA3- 2.68; CPA4- 2.48;	CPA2- 1.17; CPA3- 2.09; CPA4- 1.40;	The ERs per stove is less than the ex-ante estimated values in the CPA-DDs.
	<p>In the opinion of CCIPL, there is no change to the project design. CCIPL's verification team confirms that the CPAs are implemented within the boundary of the PoA as described in the registered PoA-DD and the implementation and operation of the project activity has been conducted in accordance with the description contained in the registered PoA-DD and registered/included CPA-DDs.</p> <p>The verification team took cognizance of § 339, § 340 and § 341 of the CDM VVS for PoA, version 01 /B01-1/ to conduct the verification and conducted a site visit in accordance with the § 320 and 321 of the CDM VVS for PoA, version 01 /B01-1/.</p>			

E.3.2. Post-registration changes

E.3.2.1. Temporary deviations from registered monitoring plan, applied methodology or applied standardized baseline

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There are no temporary deviations from the registered monitoring plan, monitoring methodology or standardized baseline during the monitoring period.

E.3.2.2. Corrections

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There are no corrections applicable to the monitoring period that have been approved by the Board during this monitoring period or to be submitted with the request for issuance.

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

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There are no changes to the start date of the crediting period for the CPAs.

E.3.2.4. Inclusion of a monitoring plan

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There are no inclusions of monitoring plan to included CPA-DDs.

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

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There are no permanent changes to the registered monitoring plan or permanent deviation of monitoring from the applied methodology.

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

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There are no changes to the programme design of the included CPA-DDs.

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

>>

Not applicable to the type of the programme of activity.

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

Means of verification	Document Review, Interview
Findings	-
Conclusion	<p>The verification team is able to confirm that the monitoring plan contained in the registered CPA-DDs is in accordance with the approved methodology applied by the project activity, i.e. AMS-II.G (version 03) /B02/.</p> <p>The monitoring plan is in accordance with the approved methodology, AMS-II.G version 03 /B02/, applied by the component project activity and as provided in the CPA-DDs /B04/. The monitoring plan is in accordance with the approved methodology, AMS-II.G, Version 03 /B02/, applied by the component project activities and as provided in the CPA-DDs /B04/.</p> <p>The verification took cognizance of § 342 to § 344 of CDM VVS for PoAs, Version 01.0 /B01-1/.</p>

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

The monitoring has been carried out in accordance with the monitoring plan contained in the registered CPA-DDs /B04/. This conclusion has been made based on assessment below in section E.3.4.1, E.3.4.2 and E.3.4.3 below.

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

Means of verification	Document Review, Interview
Findings	-
Conclusion	<p>Verification team confirms that the Data and parameters fixed ex ante are in compliance with the registered CPA-DDs /B04/ and the monitoring plan. Please refer Annex 1 for detailed analysis of the ex-ante parameters.</p> <p>The verification took cognizance of § 345 of CDM VVS for PoAs, Version 01.0 /B01-1/.</p>

E.3.4.2. Data and parameters monitored

Means of verification	Document Review, Interview
Findings	CL 03 and CAR 02 had been raised and satisfactorily closed. Please refer to Appendix 4 for further details.
Conclusion	<p>The Verification team confirms that the Data and parameters monitored are in compliance with the registered CPA-DDs/B04/ and the monitoring plan/B04/. A complete assessment of each of the monitored parameters has been provided in Annex 2 of the verification report.</p> <p>The verification took cognizance of § 345, § 346(c), §357 and §358 of CDM VVS for PoAs, Version 01.0 /B01-1/.</p>

E.3.4.3. Implementation of sampling plan

Means of verification	Document Review, Interview																														
Findings	-																														
Conclusion	<p>As mentioned in the above sections, only the CPAs 5341-0002, 5341-0003 and 5341-0004 were implemented for which emission reductions are being claimed for this monitoring period. The total population of the stoves under these three CPAs 5341-0002, 5341-0003 and 5341-0004 are 23,965, 17,754 and 24,727 respectively. The four monitoring parameters required to be monitored through the sampling plan are:</p> <ol style="list-style-type: none">1. The thermal efficiency of the ICS distributed (%) (η_{new})2. The Stove Operating Fraction, i.e. the fraction of users using the ICS (SOF)3. The fraction of stove users still using baseline (replaced) stoves (f_{old})4. The amount of woody biomass that continues to be used in the replaced stoves (kg) (μ_{old}) <p>Cross-CPA simple random sampling was applied for the three CPAs by CME for selection of the monitoring samples with 95/10 confidence/precision for all the four parameters for annual monitoring which is deemed acceptable as per the registered PoA-DD /CPA-DDs.</p> <p>Two sampling frames were applied for determining the parameters “SOF”, “f_{old}” and “μ_{old}” for the two different types of fuels used in the stoves (charcoal and wood fuel). Within the same fuel type, the stoves were considered homogeneous as they were distributed in the same country (Kenya), end users were households only and the efficiency of the different stove models distributed under the three CPAs did not differ by more than +/-10%.</p> <p>For the thermal efficiency of the stoves (η_{new}) sampling frames were chosen for the respective 6 models of stoves (CH2200, CH 4400, CH5200, CH5300, ECCL and M5000) separately.</p> <p>The number of samples for each of the parameters covered during the monitoring activity is as given below:</p> <table><tr><th>Parameter</th><th>Sample Size (n) required</th><th>Samples covered during monitoring</th></tr><tr><td>η_{new} (CH2200)</td><td>7</td><td>9</td></tr><tr><td>η_{new} (CH4400)</td><td>7</td><td>10</td></tr><tr><td>η_{new} (CH5200)</td><td>7</td><td>10</td></tr><tr><td>η_{new} (CH5300)</td><td>7</td><td>10</td></tr><tr><td>η_{new} (ECCL)</td><td>7</td><td>8</td></tr><tr><td>η_{new} (M5000)</td><td>7</td><td>11</td></tr><tr><td>SOF charcoal</td><td>68</td><td>121</td></tr><tr><td>SOF wood</td><td>68</td><td>100</td></tr><tr><td>f_{old} - charcoal</td><td>68</td><td>107</td></tr></table>	Parameter	Sample Size (n) required	Samples covered during monitoring	η_{new} (CH2200)	7	9	η_{new} (CH4400)	7	10	η_{new} (CH5200)	7	10	η_{new} (CH5300)	7	10	η_{new} (ECCL)	7	8	η_{new} (M5000)	7	11	SOF charcoal	68	121	SOF wood	68	100	f_{old} - charcoal	68	107
Parameter	Sample Size (n) required	Samples covered during monitoring																													
η_{new} (CH2200)	7	9																													
η_{new} (CH4400)	7	10																													
η_{new} (CH5200)	7	10																													
η_{new} (CH5300)	7	10																													
η_{new} (ECCL)	7	8																													
η_{new} (M5000)	7	11																													
SOF charcoal	68	121																													
SOF wood	68	100																													
f_{old} - charcoal	68	107																													

	f_{old} - wood	68	90
	μ_{old} - Charcoal	7	0 ²
	μ_{old} - Wood	7	13
<p>As the actual sample size in all the cases was not less than either the calculated sample size or the minimum sample size as per the PoA-DD, the sample size covered by the CME was accepted.</p> <p>For the monitoring parameters SOF, f_{old}, and μ_{old}, data were collected following a specially designed survey form. For thermal efficiency of the stoves WBTs (Water Boiling Tests) were conducted.</p> <p>It was found that for all the parameters the confidence/precision of 95/10 was met.</p> <p>DOE used sampling during verification for checking the operational status and to check if the WBT tests have been done in the households and it was confirmed that the WBT tests were conducted in their households. A sample size of 22 households (11 for each of the two sampling frames i.e. charcoal and wood fuel fired stoves) was chosen (with no discrepant records). A sample size of 11 was required, based on an AQL of 0.5% and UQL of 20 %, the producer and consumer risk used was 10 % each. Acceptance number (c) thus determined for the samples is 0. It was observed that out of the 22 samples, all the 22 stoves were found to be operational which matched with the CME's records and hence no discrepant records were observed with the MR /2/ and ER sheet /4/ and thus c=0. Thus, CME's set of records has been accepted in line with § 32 of the sampling standard, version 07 /B07/. For the SOF, f_{old} and μ_{old} parameter a common interview questionnaire was prepared and was used during the survey by the CME. Verification team has cross verified these sample documents during the on-site visit.</p> <p>The sampling plan implemented by the CME is in accordance with the applied approved monitoring methodology /B02/ and the PoA-DD/CPA-DDs /B04/. The CME has appropriately performed Simple Random Sampling procedure in line with the applied methodology and best suited for this type of project. As the registered PoA-DD /B04/ mentions the option for Simple Random Sampling procedure, it is acceptable to the verification team.</p> <p>The necessary confidence / precision of 95/10 each of the parameters is met. This has been cross verified by the verification team from the supporting documents submitted /4/.</p> <p>The verification took cognizance of § 347 of CDM VVS for PoAs, Version 01.0 /B01-1/.</p>			

E.3.4.4. Compliance with the calibration frequency requirements for measuring instruments

Means of verification	Document Review, Interview
Findings	-
Conclusion	<p>The stove efficiency testing has been determined by WBTs conducted in line with the guidance provided by the CME in the CPA-DDs /B04/ /15/. The monitoring equipment used for conducting the stove efficiencies by WBTs are thermometer, weighing machine and moisture meter. All the three monitoring equipment were either newly bought (weighing scale and moisture meter) or externally calibrated (thermometer) and hence deemed appropriate /12/. The appropriate QA/QC procedures have been followed for the monitoring parameters.</p> <p>The verification took cognizance of section 10.2.6 of CDM VVS for PoAs, version 01 /B01-1/.</p>

² For the charcoal survey samples, there were no households where the baseline stove was being used along with the ICS and hence this value is 0

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

In line with the requirement of § 357 and 358 of CDM VVS for PoAs, Version 01.0/B01-1/, the verification team has reviewed the Monitoring report /2/ and ER spread sheets /4/ to check the arithmetic calculation of the emission reductions. The equation used for the calculation is compared with those provided in the registered CPA-DDs /B04/ and the methodology AMS-II.G, Version 03 /B02/. In response to the review comments raised by UNFCCC, CME has discounted the emission reductions for the households for which end user data has not been presented for this monitoring period and also for the households where more than one ICS are found (for both the stoves) proportionately for the whole population.

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

Means of verification	Document Review, Interview
Findings	-
Conclusion	<p>The equations for baseline emissions, as provided in the monitoring report /1/ and confirmed with the registered CPA-DD /B04/ and the methodology AMS-II.G, Version 03 /B02/, are:</p> $ER_y = B_{y,savings} \times f_{NRB,y} \times NCV_{biomass} \times EF_{projected_fossilfuel}$ <p>Where:</p> <p>ER_y = Emission reductions during the year y in tCO₂e</p> <p>$B_{y,savings}$ = Quantity of biomass that is saved in tonnes</p> <p>$f_{NRB,y}$ = Fraction of biomass saved by the project activity in year y that can be established as non-renewable biomass using survey results, national or local statistics or other sources of information (fixed ex ante as 92%)</p> <p>$NCV_{biomass}$ = Net calorific value of the non-renewable biomass that is substituted (IPCC default for wood fuel, 0.015 TJ/tonne)</p> <p>$EF_{projected_fossilfuel}$ = Emission factor for the substitution of non-renewable biomass by similar consumer (Default value of 81.6 tCO₂/TJ).</p> $B_{y,savings} = B_{old} \cdot \left(1 - \frac{\eta_{old}}{\eta_{new}}\right)$ <p>B_{old} = Quantity of biomass used in the absence of the project activity in tonnes/year</p> <p>η_{old} = Efficiency of the system being replaced (fixed 12.9% ex ante)</p> <p>η_{new} = Efficiency of the system being deployed as part of the project activity (monitored ex post during the monitoring period)</p> $B_{old} = LAF \cdot N_{all} \cdot SOF \cdot (Q_{biomass} - \left(\frac{\mu_{old}}{1000} \cdot f_{old}\right)) \cdot Stove_{year}$ <p>LAF = Net to gross Adjustment factor (0.95) applied in accordance with paragraph 13 and 23 of AMS-II.G v. 03</p> <p>N_{all} = Total number of stoves installed</p> <p>SOF = Stove Operation Fraction - % of stoves operating or replaced by equivalent in-service appliance (monitored ex post during the monitoring period)</p> <p>$Q_{biomass}$ = Average annual biomass consumption per appliance (3.56 tonnes / year for charcoal and 4.76 tonnes/year for woodfuel fixed ex -ante).</p> <p>μ_{old} = Average amount of woody biomass consumption that is consumed through the continued use of old stoves (monitored ex post)</p> <p>f_{old} = Fraction of end users that are still using their replaced stoves during the monitoring period (monitored ex post during the monitoring period)</p> <p>$Stove_{year}$ = Calculated average stove operation years in the monitoring period (monitored ex post for the monitoring period)</p>

	<p>From the above equation and the parameter values, emission reductions are calculated as:</p> <p>5341-0002: 28,072 tCO₂e 5341-0003: 37,166 tCO₂e 5341-0004: 34,725 tCO₂e Total ER_y = 99,963 tCO₂e</p> <p>The verification team confirms that the calculation of baseline emission and emission reductions is in accordance with the applied methodological equation and the registered CPA-DDs. Calculations have been checked and confirmed from the ER spread sheet /4/.</p> <p>The verification took cognizance of § 357 of CDM VVS for PoAs, version 01.0, § 389 and § 401 of VVS Version 09.0 /B01-1/.</p>
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E.3.5.2. Calculation of project GHG emissions or actual net GHG removals by sinks

Means of verification	Document Review, Interview
Findings	-
Conclusion	There are no project emissions identified in the monitoring methodology /B02/ and the CPA-DDs /B04/.

E.3.5.3. Calculation of leakage GHG emissions

Means of verification	Document Review, Interview
Findings	-
Conclusion	<p>Net-to-gross adjustment factors for leakage (fixed default values of 0.95 as per AMS II.G. version 03) /B02/ was applied to the project activity to calculate Emission Reductions of this Monitoring Period.</p> <p>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 pre-defined formulae from registered CPA-DDs /B04/.</p>

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

Means of verification	Document Review, Interview
Findings	-
Conclusion	<p>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 pre-defined formulae from registered CPA-DDs. The total number of ERs achieved during the monitoring period is 99,963 tCO₂e.</p> <p>In summary, verification team confirms that actual emission reduction is lower than the estimate of the registered (included)/approved CPA-DDs /B04/ for the current monitoring period.</p> <p>The verification took cognizance of § 357 of CDM VVS PoAs, version 01 /B01-1/.</p>

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
5341-0001	0	-	-	0	0	0

5341-0002	28,072	0	0	0	28,072	28,072
5341-0003	37,166	0	0	0	37,166	37,166
5341-0004	34,725	0	0	0	34,725	34,725
5341-0005	0	-	-	0	0	0
5341-0006	0	-	-	0	0	0
5341-0007	0	-	-	0	0	0
Total	99,963	0	0	0	99,963	99,963

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

Means of verification	Document Review
Findings	-
Conclusion	Comparison of the actual GHG emission reductions with the estimates in the included specific CPAs is given in the below table. The verification team took cognizance of § 357 of CDM VVS for PoAs, version 01 /B01-1/.

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
5341-0001	13,556	0
5341-0002	43,063	28,072
5341-0003	42,811	37,166
5341-0004	43,384	34,725
5341-0005	6,906	0
5341-0006	6,906	0
5341-0007	6,906	0
Total	163,532	99,963

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

Means of verification	Document review
Findings	-
Conclusion	The actual emission reductions achieved during the monitoring period are less than the ex ante estimated values in the CPA-DDs.

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

Means of verification	Not applicable (as there are no sustainable development co-benefits required as per the registered CDM PoA-DD)
Findings	-
Conclusion	Not applicable The verification took cognizance of § 360 of CDM VVS PoAs, version 01 /B01-1/.

E.3.7. Global stakeholder consultation

Means of verification	Not applicable (as this is not first Monitoring report)
Findings	-
Conclusion	Not applicable (this is not first Monitoring report) The verification took cognizance of § 369 of CDM VVS PoAs, version 01 /B01-1/.

SECTION F. Internal quality control

>>

The final verification report passed a technical review before being submitted to the UNFCCC Executive Board. A technical reviewer qualified in accordance with the CC IPL's qualification scheme for CDM validation and verification has performed the technical review.

SECTION G. Verification opinion

>>

Carbon Check (India) Private Ltd. has performed the fourth periodic verification of the registered CDM Programme of Activities “Improved Cooking Stoves Programme of Activities in Africa” in Kenya and South Africa (hereafter referred to as “Programme of Activities or PoA”) for the CPAs titled “Improved Cooking Stoves Programme of Activities in Africa – CPA No. 00001 (Kenya)”; “Improved Cooking Stoves Programme of Activities in Africa – CPA No. 00002 (Kenya)”; “Improved Cooking Stoves Programme of Activities in Africa – CPA No. 00003 (Kenya)”; “Improved Cooking Stoves Programme of Activities in Africa – CPA No. 00004 (Kenya)”; “Improved Cooking Stoves Programme of Activities in Africa – CPA No. 00005 (Kenya)”; “Improved Cooking Stoves Programme of Activities in Africa – CPA No. 00006 (Kenya)” and “Improved Cooking Stoves Programme of Activities in Africa – CPA No. 00007 (Kenya)”. During the current monitoring period only 5341-0002, 5341-0003 and 5341-0004 were implemented. Hence CME is claiming emission reductions only for 5341-0002, 5341-0003 and 5341-0004 in this monitoring period.

The verification team assigned by the DOE concludes that the PoA-DD (Version 3.2, dated 27/11/2012), CPAs 5341-0002, 5341-0003 and 5341-0004 as described in the respective registered CPA-DDs /B04/ and the Monitoring report (Version 4.0, dated 02/02/2019) /2/, meet all relevant requirements of the UNFCCC for CDM project activities including article 12 of the Kyoto Protocol and paragraph 62 of CDM M& P, the modalities and procedures for CDM (Marrakesh Accords) and the subsequent decisions by the COP/MOP and CDM Executive Board. The verification has been conducted in-line with the CDM VVS for programme of activities requirements version 01.0 /B01-1/.

Verification methodology and process:

The Verification team confirms the contractual relationship signed on 13/06/2018 between the DOE, Carbon Check (India) Private Ltd. and the Co-ordinating Managing Entity/ Project Participant, (Envirofit International Ltd.). The team assigned to the verification meets the Carbon Check (India) Private Ltd.’s internal procedures including the UNFCCC requirements for the team composition and competence. The verification team has conducted a thorough contract review as per UNFCCC and Carbon Check’s procedures and requirements.

The verification is being performed as per the requirements described in the CDM VVS for programme of activities, version 01.0 /B01-1/ and constitutes the review and completion of the following steps:

- Reviewing the registered PoA-DD (Version 3.2, date 27/11/2012), the registered CPA DDs for 5341-0002, 5341-0003 and 5341-0004 (Version 2.0 date 11/10/2013, Version 2.1 dated 18/10/2013 and Version 1.0 dated 27/01/2014 respectively), including the monitoring plan and the corresponding validation report/s /B04/;
- Previous verification and certification reports and the monitoring reports for Monitoring Period 1, Monitoring Period 2 and Monitoring Period 3 /B09/;
- Publication of the MR on the UNFCCC website (version 1.0, 12/06/2018) on 19/06/2018
- Desk review of the validation report, MR and other relevant documents including documents related to the projects activities in emission reductions
- Review of the applied monitoring methodology (AMS-II.G, version 03);
- Review of any CMP and EB decisions, clarifications and guidance;
- On-site assessment (21/07/2018 – 22/07/2018)
- Resolution of CARs and CLs raised during verification (to be done)
- Issuance of Verification Report

The component project activities were correctly implemented according to the selected monitoring methodology, monitoring plan and the registered/included CPA-DDs. The monitoring system was installed, maintained in a proper manner, while collected monitoring data allowed for the verification of the amount of achieved GHG emission reductions. Through the review and on-site

visit, the verification team confirms that the PoA has resulted in the 103,271 tCO₂e emission reductions during the fourth monitoring period.

Verified emission reductions (CPA 1): 28,072 tCO₂e

Verified emission reductions (CPA 2): 37,166 tCO₂e

Verified emission reductions (CPA 3): 34,725 tCO₂e

The break-up of emission reduction upto 31st December 2012 and 1st January 2013 onwards as verified during the course of verification are as below:

Item	Emission reductions up to 31 December 2012	Emission reductions from 1 January 2013 onwards
Emission reductions (t CO ₂ e)	0	99,963

CCIPL as a DOE is therefore pleased to issue a positive verification opinion in the attached Certification statement.

SECTION H. Certification statement

>>

Carbon Check (India) Private Ltd., the DOE, has performed the verification of the registered Programme of Activities, UNFCCC Registration Number 5341, "Improved Cooking Stoves Programme of Activities in Africa" in Kenya and South Africa. The PoA involves replacement of less efficient cooking stoves using woody biomass (wood-fuel and/or charcoal) with ICS which are more efficient. The ICS distributed under CPAs of the PoA are more efficient in transferring heat from the fuel to the pot when compared to the stoves typically used in baseline. By replacing inefficient stoves, the PoA will save on consumption of woody biomass (either wood or charcoal made of wood).

The component project activities (5341-0002, 5341-0003 and 5341-0004) of the Programme of Activities are designed to generate emission reductions by distribution of the fuel-efficient charcoal / wood fuel based cook stoves in Kenya. The CME and CPA implementer are responsible for the collection of data in accordance with the monitoring plan and the reporting of GHG emissions reductions from the component project activity/ies. It is DOE's responsibility to express an independent verification statement on the reported GHG emission reductions from the component project/s. The DOE does not express any opinion on the selected baseline scenario or on the validated and registered PoA-DD/CPA-DD. The verification is carried out in-line with the VVS requirements.

The verification was performed to identify the compliance of the component project /ies with implementation and monitoring requirements, and to verify the actual amount of achieved emission reductions, through obtaining evidence and information on-site that included i) checking whether the provisions of the monitoring methodology and the monitoring plan were consistently and appropriately applied and ii) the collection of evidence supporting the reported data.

The verification is based on:

- PoA-DD Version 3.2 dated 27/11/2012;
- CPA-DD/s included in the registered PoA and its monitoring plan for the monitoring period 01/01/2017 to 31/12/2017.
- Approved monitoring methodology AMS-II.G "Energy efficiency measures in thermal applications of non-renewable biomass", Version 03;
- Validation report /B04/ for the PoA and the CPA/s;
- Monitoring reports Version 1.0, 2.0, 3.0 and 4.0 dated 12/06/2018, 31/07/2018, 21/08/2018 and 02/02/2019 respectively.

This statement covers verification period from 01/01/2017 to 31/12/2017.

The DOE had raised 03 clarification and 05 corrective action requests, all of which have been resolved by the CME. Two FARs have been raised which needs to be addressed during the next periodic verification. Please refer to Appendix 4 for further details.

The DOE considers necessary to give reasonable assurance that reported GHG emission reductions were calculated correctly on the basis of the approved baseline and monitoring methodology and the monitoring plan contained in the registered/included CPA-DDs are fairly stated.

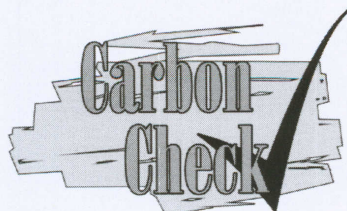
The DOE, hereby certifies that the project activity, achieved emission reductions by sources of GHG equal to 99,963 tCO₂e and all monitoring requirements have been fulfilled and is substantiated by an audit trail that contains evidence and records. The break-up of emission reduction up-to 31/12/2012 and 01/01/2013 onwards as verified during the course of verification are as below:

Item	Emission reductions up to 31 December 2012	Emission reductions from 1 January 2013 onwards
Emission reductions (t CO ₂ e)	0	99,963

Appendix 1. Abbreviations

Abbreviations	Full texts
AQL	Acceptable Quality Limit
CDM	Clean Development Mechanism
CER	Certified Emission Reduction
CAR	Corrective Action Request
CC IPL	Carbon Check (India) Private Ltd.
CER	Certified Emission Reduction
CL	Clarification Request
CME	Co-ordinating and Managing entity
CPA	Component Project Activity
CPA-DD	Component Project Activity Design Document
CO ₂	Carbon Dioxide
CO ₂ e	Carbon Dioxide Equivalent
DR	Document review
DOE	Designated Operational Entities
DVR	Draft Verification Report
EB	CDM Executive Board
EF	Emission Factor
EI	External individual
FA	Final Approval
FAR	Forward Action Request
FVR	Final verification Report
GHG	Greenhouse gas(es)
GWh	Giga Watt Hour
I	Interview
IPCC	Intergovernmental Panel on Climate Change
IR	Internal resource
MP	Monitoring Period
MWh	Mega Watt Hour
MR	Monitoring Report
PoA	Programme of Activities
PoA-DD	Programme of Activities Design Document
PP	Project Participant
OSV	On Site Visit
QC/QA	Quality control /Quality assurance
TA	Technical Area
TR	Technical Review
UNFCCC	United Nations Framework Convention on Climate Change
UQL	Unacceptable Quality Limit
VVS	Validation and Verification Standard
WBT	Water boiling test

Appendix 2. Competence of team members and technical reviewers



Carbon Check (India) Private Ltd.

Amit Anand

has been qualified as per CCIPL's internal qualification procedures, in accordance with requirements of Accreditation Standard (version 06.0):

For following functions:

Validator ☒ Team Leader ☒ Technical reviewer ☒
 Verifier ☒ Technical Expert ☒ Local Expert¹ ☒

In the following Technical Areas:

TA 1.1 ☐ TA 3.1 ☒ TA 5.2 ☐ TA 9.2 ☐ TA 13.2 ☐
 TA 1.2 ☒ TA 4.1 ☐ TA 8.1 ☒ TA 10.1 ☐ TA 14.1 ☒
 TA 2.1 ☐ TA 5.1 ☐ TA 9.1 ☐ TA 13.1 ☒

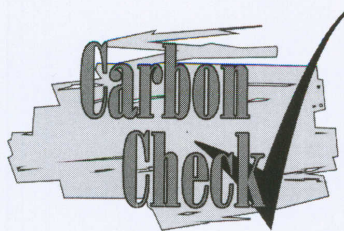
Mr. Vikash Kumar Singh
Compliance Officer

Date of Approval	Valid Till
24/12/2018	23/12/2019

Revision History of the Document	
26/12/2014	Initial Adoption
24/12/2015	Annual Revision
20/01/2016	Interim Revision for office address change
23/12/2016	Annual Revision
24/12/2017	Annual Revision
24/12/2018	Annual Revision

¹ India, South Africa

CARBON CHECK (INDIA) PRIVATE LIMITED
 Registered in India: U74930DL2012PTC232495
 Regd. Off: 2071/38, 2nd Floor, Naiwala, Karol Bagh, New Delhi - 110005
 Corporate off: G 49 & 50, 3rd Floor, Sector - 3, NOIDA (Uttar Pradesh) - 201301
 Tel: +91 120 4373114 | URL: www.carboncheck.co.in
 e-mail: info@carboncheck.co.in



Carbon Check (India) Private Ltd.

Sanjay Agarwalla

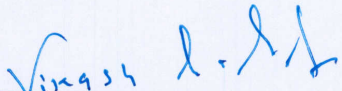
has been qualified as per CCIPL's internal qualification procedures, in accordance with requirements of Accreditation Standard (version 06.0):

For following functions:

Validator	<input checked="" type="checkbox"/>	Team Leader	<input checked="" type="checkbox"/>	Technical reviewer	<input checked="" type="checkbox"/>
Verifier	<input checked="" type="checkbox"/>	Technical Expert	<input checked="" type="checkbox"/>	Local Expert ¹	<input checked="" type="checkbox"/>

In the following Technical Areas:

TA 1.1	<input checked="" type="checkbox"/>	TA 3.1	<input checked="" type="checkbox"/>	TA 5.2	<input checked="" type="checkbox"/>	TA 9.2	<input checked="" type="checkbox"/>	TA 13.2	<input type="checkbox"/>
TA 1.2	<input checked="" type="checkbox"/>	TA 4.1	<input checked="" type="checkbox"/>	TA 8.1	<input type="checkbox"/>	TA 10.1	<input type="checkbox"/>	TA 14.1	<input type="checkbox"/>
TA 2.1	<input checked="" type="checkbox"/>	TA 5.1	<input checked="" type="checkbox"/>	TA 9.1	<input checked="" type="checkbox"/>	TA 13.1	<input checked="" type="checkbox"/>		


Mr. Vikash Kumar Singh
Compliance Officer


Mr. Amit Anand
CEO

Date of Approval
24/12/2018

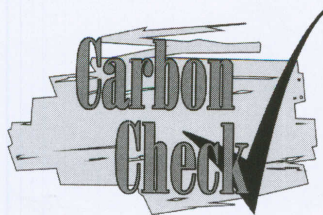
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24/12/2018	Annual Revision

¹ India

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e-mail: info@carboncheck.co.in



Carbon Check (India) Private Ltd.

Vikash Kumar Singh

has been qualified as per CCIPL's internal qualification procedures, in accordance with requirements of Accreditation Standard (version 06.0):

For following functions:

Validator	<input checked="" type="checkbox"/>	Team Leader	<input checked="" type="checkbox"/>	Technical reviewer	<input checked="" type="checkbox"/>
Verifier	<input checked="" type="checkbox"/>	Technical Expert	<input checked="" type="checkbox"/>	Local Expert ¹	<input checked="" type="checkbox"/>

In the following Technical Areas:

TA 1.1	<input type="checkbox"/>	TA 3.1	<input checked="" type="checkbox"/>	TA 5.2	<input type="checkbox"/>	TA 9.2	<input type="checkbox"/>	TA 13.2	<input checked="" type="checkbox"/>
TA 1.2	<input checked="" type="checkbox"/>	TA 4.1	<input checked="" type="checkbox"/>	TA 8.1	<input type="checkbox"/>	TA 10.1	<input type="checkbox"/>	TA 14.1	<input type="checkbox"/>
TA 2.1	<input type="checkbox"/>	TA 5.1	<input type="checkbox"/>	TA 9.1	<input type="checkbox"/>	TA 13.1	<input checked="" type="checkbox"/>		

Mr. Amit Anand
CEO

Date of Approval
24/12/2018

Valid Till
23/12/2019

Revision History of the Document

26/12/2014	Initial Adoption
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23/12/2016	Annual Revision
24/12/2017	Annual Revision
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 e-mail: info@carboncheck.co.in

Appendix 3. Documents reviewed or referenced

No.	Author	Title	References to the document	Provider
1	Envirofit	1. Webhosted Monitoring report 2. Monitoring report	Version 1.0, dated 12/06/2018 Version 3.0, dated 21/08/2018	CME
2	Envirofit	Final Monitoring report	Version 4.0, dated 02/02/2019	CME
3	Envirofit	Emission reduction calculation spread sheets for the three CPAs (5341-0002, 5341-0003 and 5341-0004) corresponding to /1/	-	CME
4	Envirofit	Emission reduction calculation spread sheets for the three CPAs (5341-0002, 5341-0003 and 5341-0004) corresponding to /2/	-	CME
5	Envirofit	CPA Monitoring Survey Records	-	CME
6	Envirofit	CPA distribution records including evidence for the dates of distribution	-	CME
7	Envirofit	Stove specifications for CH2200, CH4400, CH5200, CH5300, ECCL and M5000) models used under the monitoring period	-	CME
8	Envirofit	Proof of Carbon Credits waiver by End user	-	CME
9	Envirofit	Sample stoves sales receipt	-	CME
10	Envirofit	Training records of the Envirofit personnel on the following aspects: - Introduction to project technologies - Overview of monitoring and sampling plan - Understanding of survey questionnaire - Evaluation of user response and feedback - Assessing stove usage - WBT protocol - Measurement instruments - Conducting WBTs - Recording and archiving of data	Certificates dated Oct 2017	CME
11	Envirofit	Water boiling test records	-	CME
12	Envirofit	Manuals for the thermometer, weighing machine and moisture meter used for monitoring of the stove efficiency along with evidence of purchase of new moisture meter and weighing scale and calibration certificate for thermometer.	-	CME
13	Envirofit	Contractual agreement in between the CME and the DO as per the eligibility criteria number 13 in section A.4.2.2 of the PoA-DD	-	CME
14	Envirofit	Evidence for random number generator for sampling	-	CME
15	Envirofit	WBT conducting methodology for the cook stoves	-	CME
16	Envirofit	Sample warranty cards	-	CME
17	Envirofit	Evidence for display of programme logo on the stoves	-	CME
18	Envirofit	CME Manual for the PoA along with Organization Structure	-	CME

19	Different university/professional institutes	Competence records of the personnel who conducted WBTs and surveys	-	CME
20	Envirofit	Monitoring report	Version 2.0, dated 31/07/2018	CME
B01	UNFCCC	1. Validation and Verification Standard for PoAs, version 01.0 2. Project Standard for PoAs, version 01.0 3. Project Cycle Procedure for PoAs, version 01.0	http://cdm.unfccc.int/	Others
B02	UNFCCC	Applied baseline and monitoring methodology, AMS-II.G, version 03.0	http://cdm.unfccc.int/	Others
B03	UNFCCC	Instructions for filling out the monitoring report form for CDM programme of activities, version 02.0	http://cdm.unfccc.int/	Others
B04	UNFCCC	Registered PoA-DD (Version 3.2 dated 27/11/2012), (CPA-DD for 5341-0002: Version 2.0 dated 11/10/2013; 5341-0003: Version 2.1 dated 18/10/2013; 5341-0004: Version 1.0 dated 27/01/2014) and corresponding validation reports.	http://cdm.unfccc.int/	Others
B05	Web sites	Websites: http://cdm.unfccc.int/ http://www.ipcc-nggip.iges.or.jp/ http://www.pciaonline.org/testing	=	Others
B06	UNFCCC	Guidelines: Sampling and surveys for CDM project activities and programmes of activities, Version 04.0	http://cdm.unfccc.int/	Others
B07	UNFCCC	Standard: Standard for sampling and surveys for CDM project activities and Programme of Activities, version 07.0	http://cdm.unfccc.int/	Others
B08	UNFCCC	Guideline: Application of materiality in verifications" Version 02.0	http://cdm.unfccc.int/	Others
B09	UNFCCC	Monitoring Reports and Verification Reports of the previous monitoring periods for the PoA 5341	http://cdm.unfccc.int/	Others

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

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

FAR ID	xx	Section no.		Date: DD/MM/YYYY
Description of FAR				
-				
CME response				Date: DD/MM/YYYY
-				
Documentation provided by the CME				
-				
DOE assessment				Date: DD/MM/YYYY
-				

Table 2. CLs from this verification

CL ID	CL 01	Section no.	E.3.1	Date: 24/07/2018
Description of CL				
There are 6 models of stoves distributed under the CPAs (CH2200, CH4400, CH5200, CH5300, ECCL and M5000). But in the survey sheets stove model Econochar is also stated. Clarification is requested.				
CME response				Date: 31/07/2018
ECCL is short name for EconoCharcoal . The MR/ER Calculator have been revised to mention ECCL consistently throughout.				
Documentation provided by the CME				
5341_MP#4 MR version 2.0 31072018				
Kenya MP#4 ER calculator version 2.0 31072018				
DOE assessment				Date: 07/08/2018
CME has submitted revised MR with consistent name of the stove model ECCL. CL is closed.				

CL ID	CL 02	Section no.	E.3.1	Date: 24/07/2018
Description of CL				
Clarification is requested for the following inconsistencies:				
<ul style="list-style-type: none"> - CATHERINE MUKAMI is appearing twice in the survey samples. Clarification is requested. - The Stove serial numbers mentioned as EC1J073908 and EA1H002992 in the ER WBT summary sheet do not match with the WBT data sheet. - Stove efficiency values for the stoves EK1L030716 and EL1T019053 do not match with the WBT data sheet. 				
CME response				Date: 31/07/2018
<ul style="list-style-type: none"> - The repeated entry for Catherine Mukami, in the ER sheet, has been removed. - The Stove serial number mentioned in the ER Calculator, "WBT summary" sheet is correct as cross-checked with the original WBT records. The WBT Calculator has been revised to correct the typographical error in the serial number of these two stoves. - The Efficiency values for the stoves EK1L030716 and EL1T019053 have been revised to be consistent with the WBT Calculator. 				
Documentation provided by the CME				
Kenya MP#4 WBT calculator version 2.0 31072018				
5341_MP#4 MR version 2.0 31072018				
Kenya MP#4 ER calculator version 2.0 31072018				
DOE assessment				Date: 07/08/2018
<ul style="list-style-type: none"> - CME has corrected the double entry of the surveys which has been cross checked by the verification team and found to be acceptable. - Stove serial numbers have been corrected in the WBT calculation sheet. - Stove efficiency values have been corrected in the revised ER sheet. 				
The CL is closed.				

CL ID	CL 03	Section no.	E.3.4.2	Date: 24/07/2018
Description of CL				

CME is requested to provide the evidence of competence and training for the monitoring team and details of the monitoring equipment along with calibration status.	
CME response	Date: 31/07/2018
The calibration details for equipment used for testing stoves and the competency of team involved in monitoring are being submitted.	
Documentation provided by the CME	
Calibration Certificate for Omegaette digital thermometers Invoice for purchase of 4 thermometers, 5 weighing scales and 1 moisture meter Evidence for the training and competence of the monitoring team	
DOE assessment	Date: 07/08/2018
Evidence for the competence and training of the monitoring team along with the details of the monitoring equipment have been provided to the verification team. CL is closed.	

Table 3. CARs from this verification

CAR ID	CAR 01	Section no.	E.1.3	Date: 24/07/2016
Description of CAR				
During the on-site visit interviews and document review it was found that CPA 1 and CPA 5 are yet not implemented. CME needs to clarify then how are ERs being claimed for these CPAs.				
Also, during the interviews with the CME, it was informed to the Verification team that CPA 6 and CPA 7 are also not implemented till date, however CME wish to include these CPAs (i.e. CPA 6 and 7 which were marked as "No" i.e. not included in the MP in the MR published on UNFCCC website) in the current monitoring period without any claim of ERs.				
CME response				Date: 31/07/2018
The CPAs 1, 5, 6 and 7 have not been implemented yet. The MR has been revised accordingly to confirm the same. These CPAs have been covered in the MR as their monitoring period overlaps with the concerned monitoring period, however, No ERs are being claimed for CPA 1, 5,6 and 7 for the concerned monitoring period.				
Documentation provided by the CME				
5341_MP#4 MR version 2.0 31072018 Kenya MP#4 ER calculator version 2.0 31072018				
DOE assessment				Date: 07/08/2018
CME has submitted revised MR which confirms that the CPA 1 and CPA 5 are not implemented and there are no CERs from these CPAs.				
Furthermore, in the revised MR CPA 6 and CPA 7 are marked as "Yes" i.e. included in the MR as their monitoring period overlaps with the concerned monitoring period. CPA 6 and CPA 7 are not implemented and there no CERs from these CPAs.				
The changes are deemed acceptable and the CCIPL projects team has been notified by the verification team to inform UNFCCC about the CPA 6 and CPA 7 since they are now included in the Monitoring Report and covered in this MP. CAR is closed.				

CAR ID	CAR 02	Section no.	E.3.4.2	Date: 24/07/2018
Description of CAR				
The monitoring data and the corresponding calculations for the current monitoring period are not based on the monitored data for this monitoring period. CME needs to provide the MR and ER spread sheet based on the monitored data for the current monitoring period.				
CME response				Date: 31/07/2018
The ER volume stated in the MR version 1.0 are the ex-ante ER numbers, mentioned on account of oversight. The MR has been revised to state the correct ER volume corresponding to the monitoring data submitted (ER calculator and original monitoring survey and WBT records)				
Documentation provided by the CME				
5341_MP#4 MR version 2.0 31072018 Kenya MP#4 ER calculator version 2.0 31072018				
DOE assessment				Date: 07/08/2018
CME has submitted revised ER spread sheet and MR based on the actual monitored data for the current monitoring period. Hence the CAR is closed.				

CAR ID	CAR 03	Section no.	Completeness check	Date: 25/10/2018
Description of CAR				
<p>The sampling plans in CPA-DDs defines sampling frame of all surveyed parameters in terms of stove models (i.e. CH2200, CH4400, CH5200, CH2300, CH6600, G3300, M5000 and Z3000; section D.7.2 of CPA-DDs). However, the implemented sampling frame of three parameters (i.e. SOF, fold and μ_{old}) applied sampling frame in terms of the two stove types in those three CPAs (i.e. charcoal stove and wood fuel stove, page 16 of the monitoring report). The DOE is requested to provide information on how it has verified the compliance of the sampling practice with the sampling plan in CPA-DDs.</p>				
Project participant response				Date: 30/10/2018
<p>The PP has applied a cross CPA sampling and hence is governed by the sampling plan specified in the PoA-DD. The PoA-DD on page 47 states the following, wrt to the defining sampling frame on the basis of stove model:</p> <p><i>Stove types can be treated as sufficiently homogenous (referred to below as “similar”) provided that their efficiencies are in a similar range defined as being within +/-10% of each other and they have other common design features. This means differentiating between fixed vs portable stoves, stoves with a capacity designed for households vs institutional users, and potentially other design features that could impact on end user preferences.</i></p> <p>The ICS that have been monitored under the MP#4 are distributed over a period of time (2012-2017). The PP, in line with the para 12(b) and 12(c) of the “Standard: Sampling and surveys for CDM project activities and programmes of activities”, Version 07.0, determined the expected thermal efficiency values (mean, standard deviation) based on its knowledge and experience given ICS have been distributed over a longer time frame and will not be performing at their design / rated efficiency levels.</p> <p>The PP based on the expected thermal efficiency (which was within the +/-10% range), considered charcoal stoves into one sampling frame and fuelwood stoves into another sampling frame for other monitoring parameters. The appropriateness of the assumptions is further substantiated by the monitoring results which yield the thermal efficiency value of charcoal stoves models and fuelwood stove models well within the +/-10% range of the stoves under each sampling frame.</p> <p>Also in terms of design features the ICS in a sampling frame are not deemed to differ as they correspond to portable stove type with capacity designed for domestic usage. They do not change any end user preferences which are primarily based on fuel type (charcoal vs woodfuel), stove type (fixed vs portable) and service level type (domestic vs institutional). Also, the combustion chamber and technology in these stoves are similar. It should be noted that the physical appearance of stove models does not impact their homogeneity, as this is proved by the type (charcoal/fuelwood, fixed/portable) and level of service (domestic / institutional) provided. Thus, by virtue of their design, these charcoal stove models are considered homogenous and not impacting any end user preferences and hence have been clubbed into one sampling frame in line with PoA-DD.</p>				
Documentation provided by project participant				
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DOE assessment				Date: 31/10/2018
<p>As per the registered PoA-DD, the stoves are considered homogeneous provided that their efficiencies are in a similar range defined as being within +/-10% of each other and they have other common design features. The verification team reviewed the monitored efficiencies of the different stove models during the previous monitoring period and the current monitoring period. The verification team confirms that the different stove models implemented by the CME under the CPAs have their efficiencies within a range of +/-10%. Furthermore, all these stove models have common design features like all of them are portable stoves, designed for households. The stoves using different fuels (charcoal vs wood fuel) have been considered as non-homogeneous. Hence the consideration of the stove models (with the same fuel usage) as homogenous and under the single sampling frame for the three monitoring parameters ((i.e. SOF, fold and μ_{old}) is deemed acceptable. The CAR is closed.</p>				

CAR ID	CAR 04	Section no.	Completeness check	Date: 25/10/2018
Description of CAR				
<p>It is observed that the implemented stove models are not in line with the stove models described in the CPA-DD:</p> <p>a) In CPA 5341-0002, models CH2200, CH2300, CH4400, CH5200 and CH6600 were to be installed as per</p>				

the CPA-DD; whereas models CH2200, CH4400, CH5200 and CH5300 are actually installed.
 b) In CPA 5341-0004, models CH2200, CH2300, CH4400, CH5200, CH6600, G3300, M5000 and Z3000 were to be installed as per the CPA-DD; whereas models CH2200, CH4400, CH5200, CH5300, ECCL and M5000 are actually installed.

Project participant response	Date: 30/10/2018
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The PoA-DD in section A.4.2.1 states the following:

Other wood and charcoal stoves produced by Envirofit and/or other manufacturers could be included in a CPA under the PoA as well. Inclusion of such stoves would be subject to the completion of appropriate tests to prove that stove efficiencies meet the requirements of the methodology and the eligibility criteria of the PoA as further specified in Section A.4.2.2.

Further CPA02 CPA-DD in particular states the following in section A.5:

This includes the introduction of the advanced improved cooking stoves such as those produced by Envirofit. Below are pictures of Envirofit charcoal stoves that are envisaged to be distributed in this CPA

Thus, the aforesaid clearly states that the models specified in the CPA-DD are indicative and other models can be included in the CPA as long as they are meeting the eligibility criteria. The compliance of eligibility criteria (Technology related) for all the stoves models considered under the CPA is already discussed in section C.1 of the MR

Similarly, CPA04 CPA-DD in particular states the following in section A.5:

This includes the introduction of the advanced improved cooking stoves such as those produced by Envirofit. Below are some of Envirofit stoves that are envisaged to be distributed:

Again, the aforesaid clearly substantiates that models specified in the CPA-DD are indicative and other models can be included in the CPA.

Further, the stoves models that are not specified in the CPA-DDs and included in the CPAs for ER calculations are charcoal stove models CH5300 and ECCL. These are not much different from the models that are mentioned in the CPA and only include subtle changes to their designs over time relative to other models as continuous improvement. All the charcoal stove models specified in MR have similar combustion chamber technology. A visible difference between CH5200 and CH5300 is that CH5200 has a bottom ash collection area which can be emptied after the cooking event whereas CH5300 has an ash tray which can be emptied by pulling it out. The ECCL is also deemed similar to these stoves wrt to combustion and service level, albeit it has an outer wired frame / structure to allow holding larger sized pots offering more stability.

It should be noted that the physical appearance of stove models does not impact their homogeneity, as this is proved by the type (charcoal/fuelwood, fixed/portable) and level of service (domestic / institutional) provided. Thus, by virtue of their design these charcoal stove models are considered homogenous and not impacting any end user preferences and hence have been clubbed into one sampling frame in line with PoA-DD.

Lastly, the compliance to eligibility criteria based on technology has been demonstrated for all stove models as mentioned in section C.1 of MR. Thus, the CPAs have been implemented in line with the description specified in the registered PoA-DD/CPA-DDs

Documentation provided by project participant
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DOE assessment	Date: 31/10/2018
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The PoA-DD indicates for implementation of stove models other than that mentioned in the respective CPA-DDs subject to the completion of appropriate tests to prove that stove efficiencies meet the requirements of the methodology and the eligibility criteria of the PoA. Furthermore, the CPA-DDs also give some examples of stove models which are envisaged to be implemented in the respective CPA-DDs thereby indicating that other stove models could be implemented subject to fulfilling the above stated criteria in the PoA-DD. The verification team noted that the implementation of the stove models other than that stated in the respective CPA-DDs (CH 5300 for CPA 5341-0002 and CH 5300 & ECCL for CPA 5341-0004) meet the eligibility criteria stated in the PoA-DD. Their efficiency values are within the +/-10% range of the other stove models implemented, and all these stove models have common design features like all of them are portable stoves, designed for households. Hence the verification team considers these models of implemented stoves ((CH 5300 for CPA 5341-0002 and CH 5300 & ECCL for CPA 5341-0004) as homogenous to the models of stoves mentioned in the registered CPA-DDs. However, FAR 01 is being raised in this respect which shall be assessed by the verifying DOE during the next periodic verification.

The CAR is closed.

CAR ID	CAR 05	Section no.	Completeness check	Date: 25/10/2018
Description of CAR				
<p>Some households are observed having more-than-one stoves as per the CPA Distribution Data, e.g. customer name Alice in Nairobi and Jane in Thika etc. However, it is observed that the ex-ante parameter Q_{biomass} (i.e. 3.56 Tonne/year/stove, annual average biomass consumption per appliance) was determined assuming one cook stove per household, since it was based on biomass consumption at household level (i.e. 3.56 Tonne/year/stove = household charcoal consumption of 593kg/year/household * wood-to-charcoal conversion factor of 6). Given the fact above, the DOE shall provide information on how it has verified the appropriateness of applying 3.56 tonne/year/stove in determining the emission reductions.</p>				
Project participant response				Date: 30/10/2018
<p>More than one ICS on a single user name need not necessarily indicate them being in the same household, despite having the same user name, address and contact detail. It is a feature of last-mile distribution programmes in frontier markets that retailers of cookstoves must respond the nature of demand – that is, would a retailer refuse a sale of 20 cookstoves to the representative of a group of buyers because that representative cannot provide personal data of each of the end users? The answer is of course no, but this does not mean that the cookstoves are not valid for crediting under the CPA, because:</p> <ol style="list-style-type: none"> Often, people buy additional ICS units to give it to their immediate relatives as gift, resulting in more than one ICS on a given name. Groups of end-users buy together via a single representative, for additional discounts (bulk order discounts), at the point of retail and hence multiple stoves might be listed on a single given name in the database despite being distributed to different households in the neighbourhood. In case of donor / sponsored programs, the ICS are disseminated to different users but are owned by the donor / sponsor hence bear a common name in the database. In case of rented living / slum developments, the ICS might be bought by landlords for a number of their quarters each of which will have one stove. Hence the stove ownership lies with the landlord, but the usage is in different households. In such cases, the database may list the ICS with the landlord as the owner of the ICS. In some cases, the end user may not wish to share their private details and hence instead share the detail of the local representative like village head or the retailer from whom they have purchased the stove. <p>In all the above cases, although the actual end user is not listed in the database, it is possible to track them uniquely via the ICS serial number and contacting the buyer / owner.</p> <p>There are also checks on this in the monitoring plan. Page 38 of the PoA-DD, under the monitoring parameter table for N_{all} refers to discounting additional stoves found in a sampled household, at the time of monitoring, from the population. At the time of monitoring, the PP checks if there are multiple ICS in use in each sampled household and the presence of any additional stove is recorded. The percentage of users found having more than one ICS in the household is used to discount such multi-use scenarios from the total stove population, ensuring that only ICS per household is credited.</p> <p>Please refer the ER Calculator, tab “Monitoring Survey”. In column O:P presence of more than one ICS in the sample household is being monitored. The number of samples reporting using more than one ICS is being used to discount the total number of ICS (N_{all}) in the tab “MP#4 ER Calculations”, cell C37:E38 for CPA02, CPA03 and CPA04 respectively, for charcoal and woodfuel ICS, as applicable.</p>				
Documentation provided by project participant				
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DOE assessment				Date: 31/10/2018
<p>The clarification provided by the CME against the clarification request by UNFCCC has been reviewed by the verification team. It is deemed acceptable with the valid reasons that it is not necessary that more than one ICS being reflected in the database in the same name means that it is being used by the same end user. On page 38 of the PoA-DD it is stated “For example, if at the CPA-level it is assumed ex-ante that there is only one baseline stove being used per household, but a second ICS is found during monitoring, one of the two ICS will be excluded from the database. This way there will be no double-counting of emissions reductions”. CME has rightly followed this during the monitoring process. While doing the monitoring sampling survey, the presence of more than one ICS in the same household is monitored, duly recorded and reported. It has been checked by the verification team in the ER calculation spread sheet that presence of any second ICS in the</p>				

same house hold in the surveyed samples is discounted proportionately from the whole population. Hence the CAR is closed.

Table 4. FARs from this verification

FAR ID	FAR 01	Section No.	Completeness check comments	Date: 31/10/2018
Description of FAR				
This FAR is being raised against the closure of CAR 04. The verifying DOE shall provide an assessment opinion through PRC (notification) if there is inclusion of further models of ICS in the CPAs 5341-0002 and 5341-0004 which are additional to those listed in CPAs 5341-0002 and 5341-0004.				
CME response				Date: DD/MM/YYYY
-				
Documentation provided by the CME				
-				
DOE assessment				Date: DD/MM/YYYY
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FAR ID	FAR 02	Section No.	UNFCCC Review comment	Date: 03/02/2019
Description of FAR				
The verifying DOE shall confirm the end user data base for the whole population presented during the next verification. Also for all cases where multiple ICS are found being used in a household during monitoring, the CME shall check consistency of information with CPA database and adjust ICS population accordingly.				
CME response				Date: DD/MM/YYYY
-				
Documentation provided by the CME				
-				
DOE assessment				Date: DD/MM/YYYY
-				

Annex 1: Data and parameters fixed ex ante

Parameter	Annual average biomass consumption per appliance (Q_{biomass})
Data unit:	tonnes/year
Default values used:	3.56 (for charcoal) 4.176 (for woodfuel)
Purpose of data	Baseline emissions calculation
Source and Verification of the source	The value of this parameter is fixed ex-ante /B04/.

Parameter	Fraction of woody biomass saved by the project activity in year y that can be established as non-renewable biomass. ($f_{\text{NRB},y}$)
Data unit:	Fraction
Default values used:	0.92
Purpose of data	Baseline emissions calculation
Source and Verification of the source	The value of this parameter is fixed ex-ante /B04/.

Parameter	Net calorific value of the non-renewable biomass that is substituted ($\text{NCV}_{\text{biomass}}$)
Data unit:	TJ/tonne
Default values used:	0.015
Purpose of data	Baseline emissions calculation
Source and Verification of the source	The value of this parameter is fixed ex-ante /B04/.

Parameter	Emission factor for the substitution of non-renewable biomass by similar consumers ($\text{EF}_{\text{projected_fossilfuel}}$)
Data unit:	tCO ₂ /TJ
Default values used:	81.6
Purpose of data	Baseline emissions calculation
Source and Verification of the source	The value of this parameter is fixed ex-ante /B04/.

Parameter	Efficiency of the system being replaced (fraction) (η_{old})
Data unit:	Fraction
Default values used:	0.129 (for charcoal stoves) 0.108 (for woodfuel stoves)
Purpose of data	Baseline emissions calculation
Source and Verification of the source	The value of this parameter is fixed ex-ante /B04/.

Parameter	Net to gross adjustment factor to account for leakages (LAF)
Data unit:	Fraction
Default values used:	0.95
Purpose of data	Baseline emissions calculation
Source and Verification of the source	The value of this parameter is fixed ex-ante /B04/.

Annex 2: Data and parameters monitored

Monitoring Parameter Requirement	Assessment/ Observation by the DOE
Data / Parameter: (as in monitoring plan of CPA-DD):	Efficiency of the system being deployed as part of the project activity (η_{new})
Measuring frequency/Time Interval:	Annual
Reporting frequency:	Annual
Reported value:	29.05% for Charcoal stoves in CPA 5341-0002 28.46% for Wood fuel stoves in CPA 5341-0003 29.92% for Charcoal stoves in CPA 5341-0004 28.46% for Wood fuel stoves in CPA 5341-0004
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
Details of monitoring equipment:	The stove efficiency testing has been determined by WBTs conducted in line with the guidance provided by the CME in the CPA-DDs /B04/ /15/. The monitoring equipment used for conducting the stove efficiencies by WBTs are thermometer, weighing scale and moisture meter. These equipment were newly bought by the CME (weighing scale and moisture meter) or externally calibrated (Thermometer) hence deemed appropriate /12/. QA/QC procedures stated in MR comply with CPA-DDs.
Is accuracy of the monitoring equipment as stated in the CPA-DD? If the CPA-DD does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practise?	CPA-DDs do not specify the accuracy of the monitoring equipment (thermometer, mass balance and moisture meter). Verification team confirms that the accuracy of the monitoring equipment as stated in the MR represent good monitoring practice based on sectoral expertise.
Calibration frequency /interval: Is it monitoring methodology /CDM EB guidance / local or national standards / manufacturers specification	NA
Is the calibration interval in line with the monitoring plan of the CPA-DD? If the CPA-DD does not specify the frequency of calibration, does the selected frequency represent good monitoring practise?	Please see the above comment
Company performing the calibration(internal or external calibration):	NA
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	NA
Is (are) calibration(s) valid for the whole reporting period?	NA
If applicable, has the reported data been cross-checked with other available data?	The data has been cross-checked with the WBT test documents /11/. For the stove efficiency parameter, WBT have been performed and this has been checked by the verification team with the related spreadsheets. Furthermore, the verification team has cross checked all the raw data input records in the WBT calculation spread sheets including the calculation procedure for the sampled households and found them to be correct. All the raw data forms for the WBT carried out for efficiency parameter were checked by the verification team and thus no sampling of data is required.

How were the values in the monitoring report verified?	NA
Does the data management (from data generation to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes. As the monitoring parameter under consideration is determined by standardized test procedures (WBT), the QA/QC and calibrations are at the test conduction by the measuring team for WBT. Accordingly, the verification team has focused on abilities, qualifications and recognition of involved personnel and institutions of the measuring team involved in the WBT. The WBT has been carried by the internal team of Envirofit. The WBT has been carried out by the well-trained personnel of the Envirofit and training certificate of the personnel has been provided to the verification team in this respect /10/. The training content /10/ has also been provided to the verification team. The verification team based on on-site visit interviews and review of competency documents /19/ and training records /10/, confirms that the team was qualified to carry out the WBT in line with the protocol.
In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	NA

Monitoring Parameter Requirement	Assessment/ Observation by the DOE															
Data / Parameter: (as in monitoring plan of CPA-DD):	Total number of stoves installed (N_{all})															
Measuring frequency/Time Interval:	Continuous															
Reporting frequency:	Yearly															
Reported value:	<table><tr><th>Parameter</th><th>5341-0002</th><th>5341-0003</th><th>5341-0004</th></tr><tr><td>N_{all} - Charcoal</td><td>23,173</td><td>0</td><td>11,509</td></tr><tr><td>N_{all} - Wood</td><td>0</td><td>16,334</td><td>11,799</td></tr></table>	Parameter	5341-0002	5341-0003	5341-0004	N _{all} - Charcoal	23,173	0	11,509	N _{all} - Wood	0	16,334	11,799			
Parameter	5341-0002	5341-0003	5341-0004													
N _{all} - Charcoal	23,173	0	11,509													
N _{all} - Wood	0	16,334	11,799													
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes															
Details of monitoring equipment:	Sales database															
Is accuracy of the monitoring equipment as stated in the CPA-DD? If the CPA-DD does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practise?	An electronic sales database has been maintained for the project activity /6/															
Calibration frequency /interval: Is it monitoring methodology /CDM EB guidance / local or national standards / manufacturers specification	NA															
Is the calibration interval in line with the monitoring plan of the CPA-DD? If the CPA-DD does not specify the frequency of calibration, does the selected frequency represent good monitoring practise?	NA. QA/QC procedures stated in MR comply with CPA-DDs.															
Company performing the calibration(internal or external calibration):	NA															
Did calibration confirm proper functioning	NA															

of monitoring equipment? (Yes / No):	
Is (are) calibration(s) valid for the whole reporting period?	NA
If applicable, has the reported data been cross-checked with other available data?	Yes, the value of parameter has been cross-checked with the monitoring database /6/ and sample households and the hard copy records /9/ were also checked during the OSV.
How were the values in the monitoring report verified?	NA
Does the data management (from data generation to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the data management ensures correct transfer of data and reporting of emission reductions and all necessary QA/QC processes are in place.
In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	NA

Monitoring Parameter Requirement	Assessment/ Observation by the DOE				
Data / Parameter: (as in monitoring plan of CPA-DD):	Stove Operation Fraction – used to determine the share of distributed stoves that are still operating, measured ex-post through sampling (SOF)				
Measuring frequency/Time Interval:	Annual				
Reporting frequency:	Annual				
Reported value:	<table border="1"> <tr> <td>SOF charcoal</td><td>0.884</td></tr> <tr> <td>SOF wood</td><td>0.900</td></tr> </table>	SOF charcoal	0.884	SOF wood	0.900
SOF charcoal	0.884				
SOF wood	0.900				
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes				
Details of monitoring equipment:	Value obtained from the monitoring survey of samples /5/				
Is accuracy of the monitoring equipment as stated in the CPA-DD? If the CPA-DD does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practise?	NA				
Calibration frequency /interval: Is it monitoring methodology /CDM EB guidance / local or national standards / manufacturers specification	NA.				
Is the calibration interval in line with the monitoring plan of the CPA-DD? If the CPA-DD does not specify the frequency of calibration, does the selected frequency represent good monitoring practise?	NA. QA/QC procedures stated in MR comply with CPA-DD.				
Company performing the calibration(internal or external calibration):	NA				
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	NA				
Is (are) calibration(s) valid for the whole reporting period?	NA				
If applicable, has the reported data been cross-checked with other available data?	Yes, reported data in MR has been compared with monitoring survey records /5/ and the ER sheet /4/				
How were the values in the monitoring report	The values in the monitoring report were compared				

verified?	against the values in ER sheet
Does the data management (from data generation to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the data management ensures correct transfer of data and reporting of emission reductions and all necessary QA/QC processes are in place. The sampling survey has been carried out by the well-trained personnel of Envirofit and training certificate of the personnel has been provided to the verification team in this respect /10/. The training content /10/ has also been provided to the verification team. The verification team, based on on-site visit interviews and review of competency documents /19/ and training records /10/, confirms that the team was qualified to carry out the monitoring surveys.
In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	NA.

Monitoring Parameter Requirement	Assessment/ Observation by the DOE
Data / Parameter: (as in monitoring plan of CPA-DD):	The amount of woody biomass consumption that is consumed through the continued use of old stoves (μ old)
Measuring frequency/Time Interval:	Annual
Reporting frequency:	Annual
Reported value:	0 kg/year for charcoal stoves 1,310 kg/year for woodfuel stoves
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
Details of monitoring equipment:	Value obtained from monitoring survey of samples /5/
Is accuracy of the monitoring equipment as stated in the CPA-DD? If the CPA-DD does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practise?	NA
Calibration frequency /interval: Is it monitoring methodology /CDM EB guidance / local or national standards / manufacturers specification	NA
Is the calibration interval in line with the monitoring plan of the CPA-DD? If the CPA-DD does not specify the frequency of calibration, does the selected frequency represent good monitoring practise?	NA. QA/QC procedures stated in MR comply with CPA-DD.
Company performing the calibration(internal or external calibration):	NA
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	NA
Is (are) calibration(s) valid for the whole reporting period?	NA
If applicable, has the reported data been cross-checked with other available data?	Yes, the reported data in MR has been compared with monitoring survey records /5/ and the ER sheet /4/
How were the values in the monitoring report verified?	NA
Does the data management (from data generation to emission reduction calculation) ensure correct transfer of data and reporting	Yes, the data management ensures correct transfer of data and reporting of emission reductions and all necessary QA/QC processes are in place.

of emission reductions and are necessary QA/QC processes in place?	
In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	NA

Monitoring Parameter Requirement	Assessment/ Observation by the DOE
Data / Parameter: (as in monitoring plan of CPA-DD):	The fraction of end users that are still using baseline (replaced) stoves (f_{old})
Measuring frequency/Time Interval:	Annual
Reporting frequency:	Annual
Reported value:	0 for charcoal stoves 0.144 for woodfuel stoves
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
Details of monitoring equipment:	Value obtained from monitoring survey of samples /5/
Is accuracy of the monitoring equipment as stated in the CPA-DD? If the CPA-DD does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practise?	NA
Calibration frequency /interval: Is it monitoring methodology /CDM EB guidance / local or national standards / manufacturers specification	NA
Is the calibration interval in line with the monitoring plan of the CPA-DD? If the CPA-DD does not specify the frequency of calibration, does the selected frequency represent good monitoring practise?	NA. QA/QC procedures stated in MR comply with CPA-DD.
Company performing the calibration(internal or external calibration):	NA
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	NA
Is (are) calibration(s) valid for the whole reporting period?	NA
If applicable, has the reported data been cross-checked with other available data?	Yes, reported data in MR has been compared with monitoring survey records /5/ and the ER sheet /4/
How were the values in the monitoring report verified?	NA
Does the data management (from data generation to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the data management ensures correct transfer of data and reporting of emission reductions and all necessary QA/QC processes are in place.
In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	NA

Monitoring Parameter Requirement	Assessment/ Observation by the DOE
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Data / Parameter: (as in monitoring plan of CPA-DD):	Calculated average stove operation years in the monitoring period (Stove_{year})												
Measuring frequency/Time Interval:	Annual												
Reporting frequency:	Annual												
Reported value:	<table border="1"> <thead> <tr> <th>Parameter</th><th>5341-0002</th><th>5341-0003</th><th>5341-0004</th></tr> </thead> <tbody> <tr> <td>STOVE_{year} - Charcoal</td><td>0.65</td><td>-</td><td>0.51</td></tr> <tr> <td>STOVE_{year} - Wood</td><td>-</td><td>0.91</td><td>0.80</td></tr> </tbody> </table>	Parameter	5341-0002	5341-0003	5341-0004	STOVE _{year} - Charcoal	0.65	-	0.51	STOVE _{year} - Wood	-	0.91	0.80
Parameter	5341-0002	5341-0003	5341-0004										
STOVE _{year} - Charcoal	0.65	-	0.51										
STOVE _{year} - Wood	-	0.91	0.80										
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes												
Details of monitoring equipment:	Calculated value based on stove installation database												
Is accuracy of the monitoring equipment as stated in the CPA-DD? If the CPA-DD does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practise?	NA												
Calibration frequency /interval: Is it monitoring methodology /CDM EB guidance / local or national standards / manufacturers specification	NA.												
Is the calibration interval in line with the monitoring plan of the CPA-DD? If the CPA-DD does not specify the frequency of calibration, does the selected frequency represent good monitoring practise?	NA. QA/QC procedures stated in MR comply with CPA-DD.												
Company performing the calibration(internal or external calibration):	NA												
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	NA												
Is (are) calibration(s) valid for the whole reporting period?	NA												
If applicable, has the reported data been cross-checked with other available data?	Yes, reported data in MR has been compared with CPA distribution database /6/ and the ER sheet /4/												
How were the values in the monitoring report verified?	Yes, reported data in MR has been compared with CPA distribution database /6/ and the ER sheet /4/												
Does the data management (from data generation to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the data management ensures correct transfer of data and reporting of emission reductions and all necessary QA/QC processes are in place.												
In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	NA.												

Document information

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