Verification and certification report form for CDM programme of activities

(version 01.0)

VERIFICATION AND CERTIFICATION REPORT		
Title of the programme of activities (PoA)	Improved Cookstoves Program for Malawi and cross-border regions of Mozambique	
UNFCCC reference number of the PoA	9558	
Version number(s) of the PoA-DD(s) applicable to this report	Version 11	
Version number of the verification and certification report	1	
Completion date of the verification and certification report	30/09/2015	
Monitoring period number	1	
Duration of this monitoring period	13/03/2014 to 15/06/2015 (inclusive of both days)	
Number and version number of the monitoring report to which this report applies	Monitoring report number 01 Monitoring report version number 03	
Coordinating/managing entity (CME)	C-Quest Capital Malaysia Global Stoves Limited	
Host Party(ies)	Host Party(ies) of the PoA	Is this a host Party to a CPA covered in this report?(yes/no)
	Republic of Malawi	Yes
Sectoral scope(s)	Scope 3: Energy demand	
Selected methodology(ies)	AMS II.G Version 05	
Selected standardized baseline(s)	Not applicable	
Total estimated GHG emission reductions or net GHG removals for this monitoring period in the included CPA(s) covered in this report	79,629 tCO2e	
Total certified GHG emission reductions or net GHG removals for this monitoring period for the included CPA(s) covered in this report	41,606 tCO2e	
Name of DOE	Earthood Services Private Limited	

Name, position and signature of the approver of the verification and certification report	 Dr. Kaviraj Singh Managing Director

SECTION A. Executive summary

Brief Summary

The implemented PoA involves dissemination (distribution/installation) of fuel-efficient improved cook stoves (ICS) in Malawi, later on the stoves will also be distributed in include cross-border regions in Mozambique. There are total 3 CPAs are included in the PoA till the end of current monitoring period. The current monitoring period covering the CPA 1 (9558-0001) and CPA 2 (9558-0002) only. Both CPAs are implemented in Southern, Central and Northern region of Malawi. These three regions are divided in to 28 administrative districts. At the end of the current monitoring period 26,281 TLC Rocket cook stove units had been disseminated in the project activity as part of CPA 1 and 2. The SSC PoA is implemented in different locations of Southern, Central, Eastern and Northern region, in Malawi .

Scope of verification:
The verification is an independent and objective review and ex-post determination of the monitored reductions in GHG emissions by the DOE. The scope of this verification is limited to the implementation of registered PoA and included CPAs viz., 9558-0001 and 9558-0002 in the monitoring period. The verification tests the data and assertions set out in the monitoring report based on the following:

(i) The approved methodology AMS II.G Version 05/08/ and applied tools, applied in the PoA-DD /01/ & CPA-DDs /04, 06/
(ii) The revised approved PoA-DD /01/ & CPA-DDs /04,06/, monitoring plan and corresponding validation opinions /02, 03, 05, 07/
(iii) UNFCCC criteria referred to in the Kyoto Protocol criteria and the CDM modalities and procedures as agreed in the Bonn Agreement and the Marrakech Accords
(iv) The CDM Validation and Verification Standard (VVS) /16/
(v) The CDM Project Standard (PS) /17/ and Project Cycle Procedure (PCP) /18/
(vi) Standard: Sampling and surveys for CDM project activities and programme of activities /20/
(vii) Relevant decisions, guidance and clarifications of the CMP and CDM Executive Board and any other information and references relevant to the PoA's reported emission reductions

The verification has considered both quantitative and qualitative aspects on stated/reported emission reductions. The monitoring report (all versions) and corresponding supporting documentation was assessed in accordance with the rules defined by UNFCCC, as appropriate to the PoA. The verification is not meant to provide any consulting or recommendations to the CME/others. However, stated requests for clarifications and/or corrective actions may provide input for improvement of the monitoring activities.

Verification Process:
The verification process is conducted as per internal CDM Quality Manual, which includes the following steps;

a) Contract with CME and appointment of verification team and technical review team (refer Section B.1 and B.2 of this report)
b) Completeness check of Monitoring Report
c) Publication of Monitoring Report at UNFCCC website
d) Desk review (refer Section C.1 of this report) of Monitoring Report and corresponding ER sheet by verification team and planning of onsite audit (including sampling approach (refer Section C.4 of this report) to be applied)
e) On site audit (refer Section C.2 of this report) (physical implementation and interview with relevant stakeholders) by verification team consistent of Team Leader and all Technical Experts, as a minimum
f) Follow up activities e.g., interviews (refer Section C.3 of this report)
g) Reporting and closure of findings (CARs/CLs/FARs) and preparation of draft verification report (refer Section C.5 of this report)
h) Independent technical review (refer Section D of this report) of the draft verification report and final/revised documentation (e.g., Monitoring Report, corresponding ER sheet and evidences)
i) Reporting and closure of TR comments/findings (refer Section C.5 of this report) (CARs/CLs/FARs) and final approval for the decision made (refer Section E and F of this report).
j) Issuance of final verification report to contracted CME (or authorized representatives) and submission of request for issuance, as appropriate.

Verification Conclusion:

Based on the outcome of the verification process of the registered PoA "Improved Cookstoves Program for Malawi and cross-border regions of Mozambique" and its 02 CPAs (9558-0001 and 9558-0002) for the monitoring period 13/03/2014 - 15/06/2015 we confirm that the implementation of referenced registered PoA and CPAs is complying with applicable CDM rules and regulations as stated in the Monitoring Report (final) Version 03 dated 19/09/2015. The GHG emission reductions were calculated correctly on the basis of the approved baseline and monitoring methodology AMS II.G Version 05 and the monitoring plan contained in the revised approved PDD Version 11 dated 27/04/2015.

Earthood Services Private Limited is able to certify that the emission reductions from the registered CDM PoA UN#9558 "Improved Cookstoves Program for Malawi and cross-border regions of Mozambique" in Republic of Malawi during the period 13/03/2014 - 15/06/2015 (including both days) amount to 41,606 tCO2e. Therefore, this is being submitted for request for issuance, as per UNFCCC procedures.

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 review	On-site inspection	Interview(s)	Verification findings
1.	Team Leader	IR	Gautam	Ashok Kumar	Central Office	Y	Y	Y	Y
2.	Verifier	IR	Soni	Ravi Kant	Central Office	Y	Y	Y	Y
3.	Technical Expert TA 3.1	IR	Gautam	Ashok Kumar	Central Office	Y	Y	Y	Y
4.	Technical Expert (Trainee) TA 3.1	IR	Soni	Ravi Kant	Central Office	Y	Y	Y	Y

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	Mahawar	Abhishek	Central Office
2.	Technical Expert TA 3.1	EI	Sharma	Ashu	Central Office
3.	Approver	IR	Singh	Kaviraj	Central Office

SECTION C. Means of verification

C.1. Desk review

The desk review involves;

- A review of the data and information presented to verify their completeness;
- A review of the monitoring plan, the monitoring methodology including applicable tool(s) and, where applicable, the applied standardized baseline, paying particular attention to the frequency of measurements, the quality of metering equipment including calibration requirements, and the quality assurance and quality control procedures;
- A review of calculations and assumptions made in determining the GHG data and emission reductions;

- An evaluation of data management and the quality assurance and quality control system in the context of their influence on the generation and reporting of emission reductions;

The list of documents/evidences reviewed during the verification is provided under Appendix 3 of this report.

C.2. On-site inspection

Duration of on-site inspection: 05/08/015 to 07/08/2015				
No.	**Activity performed on-site**	**Site location**	**Date**	**Team member**
1.	Desk Review	Lilongwe	05/08/2015	Ashok Kumar Gautam Ravi Kant Soni
2	Physical site visit : Households visited (implementation of PoA)	Dowa, Rumphi	06/08/2015 07/08/2015	Ashok Kumar Gautam Ravi Kant Soni
3.	Review of information flows for generating, aggregating and reporting the monitoring parameters	Nkhotakota and Mzimba	06/08/2015 07/08/2015	Ashok Kumar Gautam Ravi Kant Soni
4.	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;	Salima and Kasungu	06/08/2015 07/08/2015	Ashok Kumar Gautam Ravi Kant Soni
5.	A check of the monitoring equipment including calibration performance and observations of monitoring practices against the applicable requirements	Salima and Kasungu	06/08/2015 07/08/2015	Ashok Kumar Gautam Ravi Kant Soni
6.	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	Salima and Kasungu	06/08/2015 07/08/2015	Ashok Kumar Gautam Ravi Kant Soni

C.3. Interviews

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1.	-	Patrick	Total Land Care (TLC)	06/08/2015	Implementation of CPAs, monitoring activities, record keeping	Ashok Kumar Gautam Ravi Kant Soni
2.	Matchichi	Aguess	Total Land Care (TLC)	06/08/2015	Implementation of CPAs, monitoring activities, record keeping	Ashok Kumar Gautam Ravi Kant Soni
3.	Kapoloma	Brown	Total Land Care (TLC)	06/08/2015	Implementation of CPAs, monitoring activities, record keeping	Ashok Kumar Gautam Ravi Kant Soni
4.	Kamwauya	Vincent	Total Land Care (TLC)	06/08/2015	Implementation of CPAs, monitoring activities, record keeping	Ashok Kumar Gautam Ravi Kant Soni
5.	-	Sefasi	Total Land Care (TLC)	06/08/2015	Implementation of CPAs, monitoring activities, record keeping	Ashok Kumar Gautam Ravi Kant Soni
6.	Goswami	Tridip	Head of Compliance, CQC	11/08/2015 18/08/2015	Sampling approach, results and ER calculations	Ashok Kumar Gautam Ravi Kant Soni
7.	Garg	Vineet	Compliance Specialist, CQC	18/08/2015 24/08/2015	Corrections in MR and ER sheet	Ashok Kumar Gautam Ravi Kant Soni
8.	Patulani	Maria	Independent household representative	06/08/2015 07/08/2015	DOE Field Survey	Ashok Kumar Gautam Ravi Kant Soni
9.	Banda	Rhoda	Independent household representative	06/08/2015 07/08/2015	DOE Field Survey	Ashok Kumar Gautam Ravi Kant Soni
10.	Twalibu	Patuma	Independent household representative	06/08/2015 07/08/2015	DOE Field Survey	Ashok Kumar Gautam Ravi Kant Soni
11.	Kazembe	Hamurab	Independent household representative	06/08/2015 07/08/2015	DOE Field Survey	Ashok Kumar Gautam Ravi Kant Soni
12.	Weluzani	Nafulawo	Independent household representative	06/08/2015 07/08/2015	DOE Field Survey	Ashok Kumar Gautam Ravi Kant Soni
13.	Ezala	Anefa	Independent household representative	06/08/2015 07/08/2015	DOE Field Survey	Ashok Kumar Gautam Ravi Kant Soni
14.	Zimanimoyo	Judith	Independent household representative	06/08/2015 07/08/2015	DOE Field Survey	Ashok Kumar Gautam Ravi Kant Soni
15.	Biason	Daresi	Independent household representative	06/08/2015 07/08/2015	DOE Field Survey	Ashok Kumar Gautam Ravi Kant Soni
16.	Isaac	Betha	Independent household representative	06/08/2015 07/08/2015	DOE Field Survey	Ashok Kumar Gautam Ravi Kant Soni
17.	Manyozo	Kwindanguwo	Independent household representative	06/08/2015 07/08/2015	DOE Field Survey	Ashok Kumar Gautam Ravi Kant Soni
18.	Cent	Elizabeth	Independent	06/08/2015	DOE Field Survey	Ashok Kumar

			household representative	07/08/2015		Gautam Ravi Kant Soni
19.	Nillibesi	Rosariya	Independent household representative	06/08/2015 07/08/2015	DOE Field Survey	Ashok Kumar Gautam Ravi Kant Soni
20.	Mbewe	Loveness	Independent household representative	06/08/2015 07/08/2015	DOE Field Survey	Ashok Kumar Gautam Ravi Kant Soni
21.	Yakobe	Iren	Independent household representative	06/08/2015 07/08/2015	DOE Field Survey	Ashok Kumar Gautam Ravi Kant Soni
22.	Makilia	Mercy	Independent household representative	06/08/2015 07/08/2015	DOE Field Survey	Ashok Kumar Gautam Ravi Kant Soni
23.	Windo	Felida	Independent household representative	06/08/2015 07/08/2015	DOE Field Survey	Ashok Kumar Gautam Ravi Kant Soni
24.	Jacob	Mallima	Independent household representative	06/08/2015 07/08/2015	DOE Field Survey	Ashok Kumar Gautam Ravi Kant Soni
25.	Davidson	Stella	Independent household representative	06/08/2015 07/08/2015	DOE Field Survey	Ashok Kumar Gautam Ravi Kant Soni
26.	Paul	Doreen	Independent household representative	06/08/2015 07/08/2015	DOE Field Survey	Ashok Kumar Gautam Ravi Kant Soni
27.	Lungu	Marry	Independent household representative	06/08/2015 07/08/2015	DOE Field Survey	Ashok Kumar Gautam Ravi Kant Soni

C.4. Sampling approach

CME's sampling approach:
The CME has applied a sampling approach as per validated PoA DD /01/ and registered CPA DDs /04, 06 /. A confidence precision 95/10 was applied by CME in the sampling. The details of sampling approach undertaken by CME is duly explained under Section B.2 of monitoring report /10/.

DOE's sampling approach:
In order to meet the requirements of paragraph 21 and 22 of Standard for Sampling and surveys for CDM project activities and programmes of activities, Version 04.1 /20/, the verification team applied acceptance sampling in the verification (in accordance with para 24). The verification team selected random sample of CME's sampled records, checked the the acceptability (or otherwise) of the data for each such record with CME's sample records, and then based on the number of records where there is agreement, determined if the CME's sample records meet the requirements.

The verification team determined the sample size for acceptance sampling by evaluating the following, using its own professional judgment and guidance in the Standard 'Sampling and surveys for CDM project activities and programme of activities' version 04.1 /20/:

- The proportion of discrepancies between the CME's data and verification team's (field or onsite inspection results) data that can be considered acceptable. This is referred to as the AQL (Acceptable Quality Level): 1.0% was considered in this verification.
- The proportion of discrepancies between the CME's data and verification team's (field or onsite inspection results) data that would be considered unacceptable. This is the UQL (Unacceptable Quality Level): 20% was considered in this verification.
- The producer risk and consumer risk: 10% was considered for both.

Considering the above input values, a sample size of 18 was required as per Table 1 in the referred Standard. Accordingly, Acceptance number (c) thus determined for the sample size is 1. A sample size of 18 meets the criteria.

Therefore, the verification team together verified the 20 samples (taking two additional samples in order to meet minimum requirement of 18 samples) during site visit and observed that all the stoves checked were in operation (100%) as against the surveyed results, which indicates 99.20% to 100%, as per the vintage of

ICS and CPA. There was no drop out observed in sample done by the verification team and thus gives a drop out of 0 %. This is considered conservative and has been accepted by the verification team. It was observed that all the stoves were in working condition and thus less than or equal to c=0, discrepant records were observed with the MR and ER sheet. Thus, CME's set of records has been accepted in line with para 28 of the sampling standard, version 04.1.

The verification team together verified the 20 samples (taking two additional samples in order to meet minimum requirement of 18 samples) during site visit and observed that all the results reported by CME for use of baseline stove (at least once in a week) were consistent with the survey results. Therefore, the use of traditional stove was accepted as 32.93%, (SSy), at least once in a week. As there were no discrepant records, CME's set of samples were accepted in line with para 28 of the sampling standard, version 04.1.

There was no DOE field survey conducted for efficiency related parameter as these were checked with the WBT records retained by the CME. The records were consistent with the reported results. The verification team checked all of the WBT results used and submitted by CME and found them in consistent and in order.

C.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	NA	NA	NA
Remaining forward action requests from validation and/or previous verification	NA	NA	NA
Specific-case CPA(s) considered for verification and covered in this report	NA	NA	NA
Programme of activities			
Compliance of the programme implementation with the registered PoA-DD	NA	NA	NA
Implementation and operation of the management system	NA	NA	NA
Post-registration changes	NA	NA	NA
• Temporary deviations from the registered monitoring plan, monitoring methodology or standardized baseline	NA	NA	NA
• Corrections	NA	NA	NA
• Inclusion of a monitoring plan in a registered PoA-DD (including its generic CPA-DD(s))	NA	NA	NA
• Permanent changes to the monitoring plan as described in the registered PoA-DD, applied methodology, or applied standardized baseline	NA	NA	NA
• 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	NA	NA	NA
• Types of changes specific to afforestation and reforestation activities	NA	NA	NA
Component project activity(ies)	NA	NA	NA
Compliance of the CPA implementation with the included CPA design document	NA	CAR#2	FAR#01
Post-registration changes	NA	NA	NA
• Temporary deviations from registered monitoring plan, applied methodology or applied standardized baseline	NA	NA	NA
• Corrections	NA	NA	NA
• Changes to the start date of the crediting period	NA	NA	NA
• Inclusion of a monitoring plan to an included CPA-DD	NA	NA	NA
• Permanent changes to the monitoring plan as described in the included CPA-DD, applied	NA	NA	NA

methodology, or applied standardized baseline			
• Changes to the programme design of the included CPA-DD	NA	NA	NA
• Types of changes specific to afforestation and reforestation component project activities	NA	NA	NA
Compliance of the monitoring plan with the monitoring methodology including applicable tool and standardized baseline	NA	NA	NA
Compliance of monitoring activities with the registered monitoring plan	NA	NA	NA
• Data and parameters fixed ex ante or at renewal of crediting period	NA	NA	NA
• Data and parameters monitored	NA	CAR #1, CAR #2	NA
• Implementation of sampling plan	NA	CAR #1	NA
Compliance with the calibration frequency requirements for measuring instruments	CL #1	NA	NA
Assessment of data and calculation of emission reductions or net removals	NA	NA	NA
• Calculation of baseline GHG emissions or baseline net GHG removals by sinks	NA	NA	NA
• Calculation of project GHG emissions or actual net GHG removals by sinks	NA	NA	NA
• Calculation of leakage GHG emissions	NA	NA	NA
• Summary of calculation of GHG emission reductions or net GHG removals by sinks	NA	NA	NA
• Comparison of actual GHG emission reductions or net GHG removals by sinks with estimates in included specific-case CPA	NA	NA	NA
• Remarks on difference from estimated value in registered PDD	NA	NA	NA
Others (please specify)	NA	NA	NA
Total	01	02	01

SECTION D. Internal quality control

The draft verification report that is prepared by verification team is reviewed by an independent technical review team (one or more members) to confirm if the internal procedures established and implemented by ESPL were duly complied with and whether such opinion/conclusion were reached in an objective manner that complies with the applicable CDM rules/requirements. The technical review team is collectively required to possess the technical expertise of all the technical area/sectoral scope the project activity relates to. All team members of technical review team are independent of the verification team.
During the technical review process additional findings may be identified or the closed out findings may be opened, which needs to be satisfactorily resolved before the request for issuance is submitted to UNFCCC. The independent technical reviewer may either approve the report as such or reject/return the same in such case providing the comments/findings/issues that needs to be resolved by the verification team. The decision taken by the Technical Reviewer is final and is authorized by the Managing Director on behalf of Earthood Services Private Limited.

SECTION E. Verification opinion

Earthood Services Private Limited (ESPL), contracted by C-Quest Capital Malaysia Global Stoves Limited (CQC) (the CME for the PoA), has performed the first independent verification of the emission reductions for the registered CDM PoA 9558 “Improved Cookstoves Program for Malawi and cross-border regions of Mozambique in Republic of Malawi for the monitoring period 13/03/2014 – 15/06/2015 as reported in the Monitoring Report (public) Version 01 dated 25/06/2015. The CME is responsible for the collection of data in accordance with the monitoring plan and the reporting of GHG emissions reductions from the PoA.

This verification report is for the CPAs (9558-0001 and 9558-0002), which were included at the UNFCCC webpage at the end of the current monitoring period. A single monitoring report has been prepared by the CME for the same in which implementation of both CPAs along with monitoring results are included.

ESPL confirms that the monitoring system is in place and the emission reductions are calculated without material misstatements. This verification report has been prepared using the latest available template specified by UNFCCC and complies with the instructions to follow as per para 406 and 407 of CDM VVS Version 9.

The verification activities were conducted in accordance with ESPL's CDM Quality Manual System as per the steps indicated under Section A of this report. The verification process has resulted in conclusion that the included CPAs confirm to the PoA DD as well as comply with applicable CDM rules and regulations and in accordance with applied monitoring methodology AMS II.G Version 05. There were no issues that were raised as FAR during validation, which required further attention from the verification team.

As a result, it is confirmed that the emission reductions from the CDM PoA 9558 "Improved Cookstoves Program for Malawi and cross-border regions of Mozambique" are correctly reported in the Monitoring Report (final) Version 03 dated 19/09/2015 /10/ and corresponding ER calculations sheet /13/ for the monitoring period 13/03/2014 – 15/06/2015 (including both days) amount as 41,606 tCO2e. Therefore, this will be submitted as part of request for issuance as per CDM PCP Version 9 /18/.

SECTION F. Certification statement

ESPL's verification approach is based on the understanding of the risks associated with reporting of GHG emission data and the controls in place to mitigate these. ESPL planned and performed the verification by obtaining evidence and other information and explanations that ESPL considered necessary to give reasonable assurance that reported GHG emission reductions are fairly stated.

In our opinion the GHG emissions reductions reported for the PoA for the period 13/03/2014 – 15/06/2015 are fairly stated in the Monitoring Report (final) Version 03 dated 19/09/2015 /10/.

ESPL, based on outcome of verification activities, certify in writing that, during the monitoring period 13/03/2014 – 15/06/2015 (including both days), the registered CDM PoA "Improved Cookstoves Program for Malawi and cross-border regions of Mozambique" and all of the included CDM CPAs (9558-0001 and 9558-0002) in the registered CDM PoA achieved the verified amount of 41,606 tCO2e reductions in anthropogenic emissions by sources of greenhouse gases that would not have occurred in the absence of the CPAs.

The verified amount of emission reductions is stated below as per each CPAs and as per commitment period;

	Emission Reductions (Amount) in this monitoring period	
CPAs (included in this request)	**Up to 31/12/2012 (1st commitment period)**	**01/01/2013 onwards**
9558-0001	**Nil**	**37,637 tCO2e**
9558-0002	**Nil**	**3,969 tCO2e**
Total	**Nil**	**41,606 tCO2e**

SECTION G. Verification findings – General

G.1. Compliance of the monitoring report with the monitoring report form

Means of verification	The verification team has compared the monitoring report with a valid applicable monitoring report form.
Findings	No finding was raised.
Conclusion	The verification team confirms that the monitoring report has been appropriately prepared using the applicable monitoring report form, and that all sections are complete.

G.2. Remaining forward action requests from validation and/or previous verification

The verification team check the validation reports /02,05, 07/ corresponding to registered PoA DD and CPA DD (0001 and 0002), validation opinions /03/ corresponding to revised PoA DD and CPA DD (0001 and

0002) and did not identify any FAR raised. This is first verification therefore there is no verification history and no FAR from there either.

G.3. Specific-case CPA(s) considered for verification and covered in this report

Reference number of the specific-case CPA included in the PoA as of the end of this monitoring period	Is the specific-case CPA considered for this verification? (yes/no)	Version number of the registered PoA-DD to which the specific-case CPA complies with	Confirmation that a request for issuance including the specific-case CPA has been published for the previous monitoring period (Y/N)
9558-0001	Yes	Version 11,dated 27/04/2015	NA. This is the first verification period.
9558-0002	Yes	Version 11,dated 27/04/2015	NA. This is the first verification period.

SECTION H. Verification findings – Programme of activities

H.1. Compliance of the programme implementation with the registered programme design document

Means of verification

The registered PoA involves the promotion, distribution and sale of improved cooking stoves (ICS) in Malawi and at later stage the stoves will also be distributed in include cross-border regions in Mozambique. The overall responsibility of implementation and operation is with C-Quest Capital Malaysia Global Stoves Limited (CME), which was also evident during the site visit. This is consistent with PoA DD /01/.

There are total 3 CPAs that are included in the registered PoA at the end date of current monitoring period. However the monitroing report and this verification includes the implementation and monitoring of 2 CPAs (9558-0001 and 9558-0002). The implementation of all CPAs, as referenced above, are within the geographical boundary of the PoA DD, which constitutes the physical boundary as well.

In the referenced CPAs and in the curent monitoring period, only one model of the improved cookstove (ICS) i.e., TLC Rocket Stove is deployed/installed/distributed in Southern, Central and Northern region of Malawi. These three regions are divided in to 28 administrative districts The distribution/ implementation of the ICS under both the CPAs is done by the Total Land Care (TLC) Malawi who is the sole CPA implementer for the PoA.

This was confirmed through the ICS registration database of each CPA /22/. The start date of the registered PoA is 30/04/2012, which is consistent with registered PoA DD. The first stove was distributed on 21/08/2013 i.e., after the registration of PoA, as part of distribution for CPA 9558-0001. The total number of stoves that were installed/distributed at the end of the current monitoring period as per specific case CPA DD were verified as under;

CPA	ICS Registered	Estimated ICS	Date of installation of (ICS)	Date of registration (Earliest)	First day of Monitoring Period (as per CPA)
9558-0001	20,077	20,763	21/08/2013	20/10/2013	13/03/2014
9558-0002	6,204	20,763	24/09/2013	10/12/2014	10/12/2014
Total	26,281	41,526	-	-	

	Therefore, the quantity, specification and target group of the ICS were found consistent with the PoA DD /01/ and respective CPA DDs /04, 06/. Further, based on the review of registration database of ICS /22/, physical observations and interview conducted during the site visit, the verification team found that the actual implementation on ground of the PoA is consistent with PoA DD and respective CPA DDs /04, 06/.
Findings	No finding was raised.
Conclusion	The verification team confirms that the physical features (technology/type of ICS) of the implementation were in accordance with the revised PoA DD /01/. The distribution of ICS is still ongoing as it has not yet reached the estimated quantity given in the respective specific case CPA DDs /04, 06/. The actual operation is in line to respective CPA DD, which is further explained under Section I.1 of this report. No information with regard to data and variables was identified that may surpass the estimated quantity of ERs in the respective CPA DDs. The emission reductions achieved for each specific case CPA DD were within the estimated quantity in the registered CPA DD.

H.2. Implementation and operation of the management system

Means of verification	Based on the interview of CME representative (CME) and monitoring team during the site visit, it was confirmed that the CME has organized an appropriate management and operational system for implementation, monitoring and reporting functions. TLC (CPA implementer) has a database manager who manages the process of collecting the completed sales receipts from the stove distributors and entering the data into the database. The monitoring manager at the CME is then responsible for QA/QC of the data, analysis and reporting into the monitoring report. For survey data, a monitoring team has been organized by the CME consisting of trained monitoring staff, who conducted the surveys and WBTs. The monitoring manager at the CME is responsible for QA/QC of the data, analysis and reporting into the monitoring report. CPA Implementer field staff continually randomly select households included in the database /22/ and visit them to cross-check the information on the database with the factual evidence in the field, referred as spot check. Any inconsistencies found (e.g., change in the address of a user) are updated on the database, and in the case ICS are found to be no longer in use, they will be clearly marked as such and excluded from emission reductions calculations. The electronic database /22/ containing the monitored data were maintained by the CME. The database (and its backup) were checked during the site visit. The database is stored online so it is accessible to both the CME monitoring manager in India, and the CME head office in Malaysia. Original copies of distribution record/user agreements and completed survey forms and WBT test reports /23/ are retained by the CPA implementer. The organizational structure and roles and responsibilities for monitoring are in line with the situation on the ground as observed during the site visit, and the structure is considered appropriate.
Findings	No finding was raised.
Conclusion	The verification team assessed the management systems in place to implement the monitoring of the PoA. This included the roles and responsibilities, data collection, transfer and aggregation procedures, data storage and archiving for the monitoring system. The roles and responsibilities data collection transfer and aggregation procedures, data storage and archiving for the monitoring system have been provided in the MR /10/. The verification team confirms that the monitoring management system of the PoA is in place with the responsibilities properly identified and established.

H.3. Post-registration changes

H.3.1. Temporary deviations from the registered monitoring plan, monitoring methodology or standardized baseline

No deviations were identified during the verification of current monitoring period.

H.3.2. Corrections

The corrections to the registered PoA-DD have been approved on 11/08/2015 (Ref: PRC-9558-001). No corrections were identified during the verification of current monitoring period.

H.3.3. Inclusion of a monitoring plan in a registered PoA-DD (including its generic CPA-DD(s))

Not applicable.

H.3.4. Permanent changes to the monitoring plan as described in the registered PoA-DD, applied methodology, or applied standardized baseline

The permanent changes to the registered monitoring plan as described in the registered PoA-DD have been approved on 11/08/2015 (Ref: PRC-9558-001). No permanent changes were identified during the verification of current monitoring period.

H.3.5. 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

No changes to the programme design of PoA-DD were identified during the current monitoring period.

H.3.6. Types of changes specific to afforestation and reforestation activities

Not applicable.

SECTION I. Verification findings – Component project activity(ies)

I.1. Compliance of the CPA implementation with the included CPA design document

Means of verification	There are 03 specific CPAs (9558-0001, 9558-0002 and 9558-0003) included in the registered PoA at the end of the current monitoring period. However only 2 CPAs (9558-0001 and 9558-0002) are covered in the current monitoring period as part of this verification. Both the CPAs are grouped together in this section (i.e., Section I) for the purpose of verification and reporting as these are of similar in nature (technology and type). Each of the specific CPA targets the promotion, distribution and sale of TLC Rocket Stove in Malawi. **C-Quest Capital Malaysia Global Stoves Limited** is the Coordinating and Managing Entity (CME) for the implementation of CPA and Total Land Care (TLC) Malawi is the CPA implementer for both the CPAs. The CME has contractual agreement with TLC and coordinates with them for the implementation of each element of the monitoring plan. There are 28 districts under three regions (Southern, Central and Northern region) in which included specific CPAs were implemented. The implementation and operation status of each CPA has been verified as follows: **9558-0001 (also referred to as CPA 001):** ICS were distributed in different villages all of which were located across the different districts in Southern, Central and Northern region of Malawi, which is consistent with the description given in the included CPA DD (Section A.7). By the end of current monitoring period total 20,077 cook stoves were disseminated under CPA 001, which is within estimated quantity of 20,763 ICSs as per Section A.3 of the CPA DD. It has been checked by the verification team that the CPA is way below the threshold of 180 GWh/year (thermal). The distribution model in CPA 1 is that stoves are distributed by Total Land Care and managed by CME. The stoves are distributed to end users, these are installed

	as per required specification and installation date is recorded through a mobile based app (ODK – Open Data Kit). The other details e.g., unique geographical coordinates, administrative unit, user name, phone number etc. are also recorded. Once the ICS is installed it is revisited by TLC field staff after few days/weeks (in general) to check whether the constructed stove meets the specified specifications and once it is found of acceptable quality, the same ICS is registered in the same manner through ODK. This date constitutes as the registration date. The ICSs that do not meet the specifications are not registered at this stage and are kept out of CPA DD boundary. The operation/use of ICS starts from the installation date itself. **9558-0002 (also referred to as CPA 002):** ICS were distributed in different villages all of which were located across the different districts in Southern, Central and Northern region of Malawi, which is consistent with the description given in the included CPA DD (Section A.7). At the end of current monitoring period a total 6,204 of ICS were disseminated under CPA 0002, which is within estimated quantity of 20,763 ICSs as per Section A.3 of the CPA DD. It has been checked by the verification team that the CPA is way below the threshold of 180 GWh/year (thermal). The distribution model in CPA 2 is that stoves are distributed by Total Land Care and managed by CME. The stoves are distributed to end users, these are installed as per required specification and installation date is recorded through a mobile based app (ODK – Open Data Kit). The other details e.g., unique geographical coordinates, administrative unit, user name, phone number etc. are also recorded. Once the ICS is installed it is revisited by TLC field staff after few days/weeks (in general) to check whether the constructed stove meets the specified specifications and once it is found of acceptable quality, the same ICS is registered in the same manner through ODK. This date constitutes as the registration date. The ICSs that do not meet the specifications are not registered at this stage and are kept out of CPA DD boundary. The operation/use of ICS starts from the installation date itself. Based on review of the database for both the CPAs, the verification team is able to confirm that the stoves were distributed in Malawi only. The database records /22/ the stove unique serial number ID (registration number) and name of household with address. Stove IDs are used for unique identification of the units. Stove registration numbers are either marked on the stove, on the kitchen wall. The unique stove ID is also recorded on the ICS registration database /22/. The type of stoves distributed was confirmed to be TLC Rocket stoves based on site visit observations in households. This information is consistent with the revised approved PoA-DD /01/ and CPA-DDs /04, 06/. The final MR /10/ includes complete description of the implementing partners, locations, and implementation status, which is consistent with the observations and interviews during the site visit as well as review of the sales database.
Findings	CAR#2, FAR#1
Conclusion	The verification team is of the opinion that physical features of the CPAs have been implemented in accordance with the registered CPA-DDs. No specific monitoring equipment had to be installed according to the monitoring plan. It is also confirmed, through the physical site visit and review of the supporting documentation that physical features of the component CPAs have been implemented in accordance with the CPA-DDs /04, 06/. The CPAs were also found to be completely operational in line with the CPA-DDs. The information provided in the relevant sections of the monitoring report are appropriately describe the implementation and operational status of the PoA.

I.2. Post-registration changes

I.2.1. Temporary deviations from registered monitoring plan, applied methodology or applied standardized baseline

No deviations were identified during the current monitoring period.

I.2.2. Corrections

There were corrections proposed as part of PRC-9558-001 request in which CPA DDs were revised for CPA 0001, 0002 and 0003. The proposed PRC was accepted and approved on 11/08/2015. No further changes were identified during the current verification.

I.2.3. Changes to the start date of the crediting period

N/A

I.2.4. Inclusion of a monitoring plan to an included CPA-DD

Not applicable.

I.2.5. Permanent changes to the monitoring plan as described in the included CPA-DD, applied methodology, or applied standardized baseline

There were permanent changes proposed as part of PRC-9558-001 request in which CPA DDs were revised for CPA 0001, 0002 and 0003. The proposed PRC was accepted and approved on 11/08/2015. No further changes were identified during the current verification.

I.2.6. Changes to the programme design of the included CPA-DD

No such changes were identified during the current monitoring period.

I.2.7. Types of changes specific to afforestation and reforestation component project activities

Not applicable.

I.3. Compliance of monitoring plan with the monitoring methodology including applicable tool and standardized baseline

Means of verification	The monitoring plan as contained in all CPA DDs /04, 06/ was reviewed against the monitoring requirements of the applied methodology AMS-II.G version 05 /08/ as well as PoA DD /01/. Based on this review it was found the monitoring plan contained in the CPA DDs includes all the required parameters to be monitored in the context of the CPA design and description and allows proper determination of emission reductions in accordance with PoA DD /01/ and applied methodology AMS-II.G version 05 /08/.
Findings	No finding was raised.
Conclusion	The monitoring plan is in accordance with the approved methodology, AMS-II.G version 05 /08/, that is included in each CPA DD /04, 06/.

I.4. Compliance of monitoring activities with the registered monitoring plan

I.4.1. Data and parameters fixed ex ante or at renewal of crediting period

Quantity of woody biomass used in absence of the project activity per device (B_{old}), Tonnes / year

Means of verification	The value of this parameter is considered as 3.2558.This was checked with the revised approved PoA DD /01/ (page 26) and registered CPA-DD /04, 06/ for each relevant CPAs.
Findings	No finding was raised.
Conclusion	The values in the monitoring report /10/ and corresponding emission reduction calculations spreadsheet /13/ are consistent with the revised approved PoA-DD /01/ and CPA-DDs /04, 06/. The applied value is correct and justified.

Fraction of woody biomass saved by the project activity in year y that can be established as non-renewable biomass ($f_{NRB,y}$), Fraction

Means of verification	The value of this parameter is considered for the concerned regions as following:

Region	f_{NRB}
Central	0.97

	Northern: 0.93 Southern: 0.90 This was checked with the revised PoA DD (page26) and registered CPA-DD for each relevant CPAs.
Findings	No finding was raised.
Conclusion	The values in the monitoring report /10/ and corresponding emission reduction calculations spreadsheet /13/ are consistent with the revised approved PoA-DD /01/ and CPA-DDs /04, 06/. The applied value is correct and justified.

Efficiency of 3-stone fire or traditional pot support cooking method (system being replaced) (η_{old}), Fraction

Means of verification	The value of this parameter is considered as 0.10. This was checked with the revised PoA DD (page 26) and registered CPA-DD for each relevant CPAs.
Findings	No finding was raised.
Conclusion	The values in the monitoring report /10/ and corresponding emission reduction calculations spreadsheet /13/ are consistent with the revised approved PoA-DD and CPA-DDs /04, 06/. The values were found consistent with applied methodology AMS II.G Version 5 /08/. The applied value is correct and justified.

Emission factor: substitution of non-renewable woody biomass by similar consumers ($EF_{projected\_fossilfuel}$), tCO2/TJ

Means of verification	The value of this parameter is considered as 81.6. This was checked with the revised PoA DD (page 27) and registered CPA-DD for each relevant CPAs.
Findings	No finding was raised.
Conclusion	The values in the monitoring report /10/ and corresponding emission reduction calculations spreadsheet /13/ are consistent with the revised approved PoA-DD and CPA-DDs /04, 06/. The values were found consistent with IPCC /34/. The applied value is correct and justified.

Net calorific value of the non-renewable woody biomass that is substituted ($NCV_{biomass}$), TJ/ tne

Means of verification	The value of this parameter is considered as 0.015. This was checked with the revised PoA DD (page 27) and registered CPA-DD for each relevant CPAs.
Findings	No finding was raised.
Conclusion	The values in the monitoring report /10/ and corresponding emission reduction calculations spreadsheet /13/ are consistent with the revised approved PoA-DD and CPA-DDs /04, 06/. The values were found consistent with IPCC /34/. The applied value is correct and justified.

Leakage adjustment factor (L), Fraction

Means of verification	The value of this parameter is considered as 0.95. This was checked with the revised PoA DD (page 27) and registered CPA-DD for each relevant CPAs.
Findings	No finding was raised.
Conclusion	The values in the monitoring report /10/ and corresponding emission reduction calculations spreadsheet /13/ are consistent with the revised approved PoA-DD and CPA-DDs /04, 06/. The values were found consistent with applied methodology AMS II.G Version 5 /08/. The applied value is correct and justified.

I.4.2. Data and parameters monitored

Number of stoves still in operation during the monitoring period as determined by the monitoring survey. This includes total number of stoves installed in the entire CPA. ($n_{y,j}$),Quantity :

Means of verification	**Criteria/Requirements** / **Assessment/Observation** Measuring /Reading /Recording frequency / The monitoring frequency is annual in the CPA DD (page 23) and PoA DD (page 31).

		In accordance with Section B.7.2 of PoA DD /01/,it is mentioned that if a single CPA is sampled, 90/10 confidence/precision for annual and 95/10 confidence/precision shall be required for biennial sampling.
	Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes. The PoA DD allows the monitoring frequency to be once in two years provided confidence level and precision are appropriately considered. In the current monitoring period 95/10 has been considered.
	Monitoring equipment	Not applicable
	Is accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer's specification?	Not applicable
	Is the accuracy valid for the entire measuring range or do different accuracy levels apply to different measuring ranges?	Not applicable
	Calibration frequency /interval:	Not applicable
	Is the calibration interval in line with the monitoring plan and/or methodology? If the monitoring plan does not specify the frequency of calibration, is the selected frequency in accordance with the local/national standards, or as per the manufacturer's specifications?	Not applicable
	Is the calibration of measuring equipment carried out by an accredited person or institution?	Not applicable
	Is(are) calibration(s) valid for the whole reporting period?	Not applicable
	Is the calibration carried out for a measuring range comparable with the range for which measurements have been carried out?	Not applicable
	How were the values in the monitoring report verified?	The value of parameter is calculated based on the survey that was conducted by TLC for the included CPAs in the current monitoring period. This survey provided the value for the p_y (Proportion of installed ICS operating) in both the CPAs. In all, sample size for this parameter is calculated 188, however total 251 samples were surveyed/responded.

		The results of sampling survey were verified as following: Number of responded samples: 251 Number of ICS found in operation: 249 Number of ICS non-operating: 2 Value of the p_y: 99.20 % CPA 9558-0001: $N_{y,i}$ 19,916 CPA 9558-0002: $N_{y,i}$ 6,154 The calculation for determining the sample size were checked by the verification team and found to be appropriate and consistent with PoA DD (page 31). The value of p_y, thus determined, is multiplied with ICS stoves installed/distributed (Z) of that type in the respective CPAs. The verified values are in included in the final Monitoring Report /10/. The required level of precision i.e. 10% or less has been achieved at 95% confidence level (the actual value of precision achieved is 1.10%)
	If applicable, has the reported data been cross-checked with other available data?	The survey results, assumptions and sales records (for Z) were checked by the verification team and were found acceptable. The results are reproducible in the corresponding ER sheet of final Monitoring Report. The verification team randomly selected 20 samples for DOE's field survey and found that all the ICS were operational, which was consistent with the CME's sample survey result.
	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes. The QA/QC procedure are in place, internal checks have been done by the CPA implementer and established during the onsite assessment. Once the ICS is installed/distributed to the beneficiary it is registered into respective CPA database. The spot checks were regularly conducted by TLC (seller/distributor) in order to correct the CPA database, as appropriate. During the site visit the distribution process, record keeping (registration dates) /35/ and process of spot check were reviewed and were found reliable.

	In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by Appendix 1 to the CDM Project Standard?	Not applicable
Findings	CL#01, CAR#01, CAR#2	
Conclusion	The parameter has been monitored appropriately, in accordance with the registered monitoring plan (as per measurement methods and procedures to be applied) and applied methodology. The monitoring results were recorded consistently as per the approved frequency in the monitoring plan.	

The percentage of ongoing baseline stove use within the population of in-use ICS during a monitoring period. (SSy)

Means of verification	**Criteria/Requirements**	**Assessment/Observation**
	Measuring /Reading /Recording frequency	The monitoring frequency is annual in the CPA DD and in the PoA DD (page 32). In accordance with Section B.7.2 of PoA DD the required confidence level and precision for biennial sampling is 95/10
	Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes. The PoA DD allows the monitoring frequency to be once in two years provided confidence level and precision are appropriately considered. In the current monitoring period 95/10 has been considered.
	Monitoring equipment	Not applicable
	Is accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer's specification?	Not applicable
	Is the accuracy valid for the entire measuring range or do different accuracy levels apply to different measuring ranges?	Not applicable
	Calibration frequency /interval:	Not applicable
	Is the calibration interval in line with the monitoring plan and/or methodology? If the monitoring plan does not specify the frequency of calibration, is the selected frequency in accordance with the local/national standards, or as per the manufacturer's specifications?	Not applicable

	Is the calibration of measuring equipment carried out by an accredited person or institution?	Not applicable
	Is(are) calibration(s) valid for the whole reporting period?	Not applicable
	Is the calibration carried out for a measuring range comparable with the range for which measurements have been carried out?	Not applicable
	How were the values in the monitoring report verified?	The value of parameter is calculated based on the survey (together with n_{yj}) that was conducted by TLC for the included CPAs in the current monitoring period. The monitoring of this parameter was done through interviews with end users as part of the monitoring survey performed by the monitoring team using the questionnaire developed by the CME. The parameter SS_y is proportion based parameter and as per the "Standard for sampling and surveys for CDM project activities and programme of activities", a proportion can be described considering either of the two possible scenarios: • the success rate (p) • the failure rate(1-p) It is recommended that the project proponents may use the larger of the two proportions in the sample size calculation, which is p or (1−p). For the CPAs under concerned in this monitoring period, there were 2 possible scenarios taken in to consideration while conducting the survey i.e. • Continued-use rate of baseline stoves • Discontinued-use rate of baseline stoves As per the data obtained through pilot study, discontinued-use rates of baseline stove was found to be higher proportion, hence the survey was conducted to study the discontinued-use rate of baseline stoves and the same is determined as 67.07% as per the below results:

Number samples responded	249
Number of household using baseline stove with ICS	82

		Number of household not using baseline stove with ICS: 167 The verified values are in included in the final Monitoring Report /10/. The required level of precision i.e. 10% or less has been achieved at 95% confidence level (actual value of precision achieved is 8.66%). The value of SS_y was verified as (1-0.6707) i.e., 32.93%.
	If applicable, has the reported data been cross-checked with other available data?	The survey results /23/ were checked by the verification team and were found acceptable. The results are reproducible in the corresponding ER sheet /13/ of final Monitoring Report /10/. The verification team randomly selected 20 samples for DOE's field survey and found that all the ICS were operational and no household visited by verification team actually had any additional baseline stove in use, which was consistent with the CME's sample survey results /23/.
	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Based on the interaction during on site visit the verification team confirmed that trainings were provided to the staff responsible for collection of data and that the QA/QC procedure are in place.
	In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by Appendix 1 to the CDM Project Standard?	Not applicable
Findings	CL#01, CAR#01, CAR#02	
Conclusion	The parameter has been monitored appropriately, in accordance with the registered monitoring plan (as per measurement methods and procedures to be applied) and applied methodology. The monitoring results were recorded consistently as per the approved frequency in the monitoring plan.	

Fraction of monitoring period the stove is in operation (days in operation/total days in monitoring period) (t_{yj}), fraction:

Means of verification	**Criteria/Requirements**	**Assessment/Observation**
	Measuring /Reading /Recording frequency	Continuously measured for each stove and consolidated result presented for the whole monitoring period.

	Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes as per PoA DD (page 32)
	Monitoring equipment	Not applicable
	Is accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer's specification?	Not applicable
	Is the accuracy valid for the entire measuring range or do different accuracy levels apply to different measuring ranges?	Not applicable
	Calibration frequency /interval:	Not applicable
	Is the calibration interval in line with the monitoring plan and/or methodology? If the monitoring plan does not specify the frequency of calibration, is the selected frequency in accordance with the local/national standards, or as per the manufacturer's specifications?	Not applicable
	Is the calibration of measuring equipment carried out by an accredited person or institution?	Not applicable
	Is(are) calibration(s) valid for the whole reporting period?	Not applicable
	Is the calibration carried out for a measuring range comparable with the range for which measurements have been carried out?	Not applicable
	How were the values in the monitoring report verified?	The parameter is calculated based on the formula t_{yj} = Date of end of monitoring – Maximum of date of ICS registration or date of beginning of monitoring period (of respective CPA) / Length of current monitoring period. The maximum value for any stove can be 1 e.g., for ICS registered prior to commencement of current monitoring period. The lowest can be 0 e.g., for ICS registered after the end date of current monitoring period. For all other ICS, in between, the value will result in fraction. The verification team has verified that the application of formula results in appropriate output as it also considers the start date of

		respective CPA. Finally, an average value was calculated for all ICS installed/distributed for each CPA. The verified results are included in the final Monitoring Report /10/ and corresponding ER sheet /13/. The verified results were; **CPAs** / t_{yj} 9558-0001 / 0.67 9558-0002 / 0.56
	If applicable, has the reported data been cross-checked with other available data?	All the input values used to calculate this parameter were cross-checked by verification team e.g., Registration database for ICS /22/ (for dates), relevant dates of crediting and monitoring period.
	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Once the ICS is installed/distributed to the beneficiary it is registered into respective CPA database. The spot checks were regularly conducted by TLC (seller/distributor) in order to correct the CPA database, as appropriate. During the site visit the distribution process, record keeping (registration dates) /35/ and process of spot check were reviewed and were found reliable.
	In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by Appendix 1 to the CDM Project Standard?	Not applicable
Findings	No finding was raised	
Conclusion	The parameter has been monitored appropriately, in accordance with the registered monitoring plan (as per measurement methods and procedures to be applied) and applied methodology. The monitoring results were recorded consistently as per the approved frequency in the monitoring plan.	

Efficiency of the new stove ($\eta_{new,i}$), fraction

Means of verification	**Criteria/Requirements**	**Assessment/Observation**
	Measuring /Reading /Recording frequency	Calculated once in a year using Water Boiling Test.
	Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes as per PoA DD (page 32) /01/
	Monitoring equipment	The WBT tests were coordinated by the CME and undertaken following a simplified version of WBT protocol 4.2.2 /26/ by an experienced party. The PoA DD or CPA DDs do not prescribe any specific monitoring equipment but weighing scale and thermometer were required and used to

		conduct WBT. The detail is provided under Section I.5 of this report.
	Is accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer's specification?	Yes, the accuracy comply with manufacturer's recommendation.
	Is the accuracy valid for the entire measuring range or do different accuracy levels apply to different measuring ranges?	Yes, the accuracy is valid for entire range.
	Calibration frequency /interval:	Please refer Section I.5 of this report
	Is the calibration interval in line with the monitoring plan and/or methodology? If the monitoring plan does not specify the frequency of calibration, is the selected frequency in accordance with the local/national standards, or as per the manufacturer's specifications?	Please refer Section I.5 of this report
	Is the calibration of measuring equipment carried out by an accredited person or institution?	Please refer Section I.5 of this report
	Is(are) calibration(s) valid for the whole reporting period?	Please refer Section I.5 of this report
	Is the calibration carried out for a measuring range comparable with the range for which measurements have been carried out?	Please refer Section I.5 of this report
	How were the values in the monitoring report verified?	The reported values were checked with the actual WBT results and CME filled in Sheets (for this purpose) and were found consistent. The WBT results were conducted for ICS based on Vintage using sampling survey. The sample survey approach is included under Section I.4.3 of this report. The verified values are summarized below; $(\eta_{new,i})$ Vintage 1: 0.2717 Vintage 2: 0.2789
	If applicable, has the reported data been cross-checked with other available data?	The data has been cross-checked with the estimated efficiency (25.66 %) in the CPA DDs. The actual efficiencies in this monitoring period were slightly higher but comparable.

	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Based on the interaction during on site visit the verification team confirmed that trainings were provided to the staff responsible for conducting the WBT and that the QA/QC procedure are in place. WBT Protocol Version 4.2.2 /26/ was applied, which is acceptable.
	In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by Appendix 1 to the CDM Project Standard?	Not applicable
Findings	CL#01, CAR#01	
Conclusion	The parameter has been monitored appropriately, in accordance with the registered monitoring plan (as per measurement methods and procedures to be applied) and applied methodology. The monitoring results were recorded consistently as per the approved frequency in the monitoring plan.	

I.4.3. Implementation of sampling plan

Means of verification	The monitoring has been carried out in accordance with the monitoring plan contained in the revised approved PoA DD /01/ and respective CPA DDs /04, 06/. **Sampling Design/Target Population/Sampling Frame/Reliability**: A simple random sampling method has been used, which is in line with the monitoring plan of the revised approved PoA DD (Section B.7.2) as referred in the respective CPA-DDs. In this sampling design both the CPAs that are included under the current monitoring period were subject. The sampling frame considered confidence level and precision as 95/10 in line with the requirement of Standard for sampling and surveys for CDM PAs and PoAs. As there was only one CPA implementer, it was considered as Primary Sample Unit. The target population was the households located in different districts in all 3 regions of Malawi. **Sampling Method:** Simple Random Sampling is used and samples were randomly selected from the primary sampling unit i.e. sales records database, which includes all ICS which have been disseminated up to the end of the monitoring period. To ensure a random selection of ICS, random number generators was applied. Each ICS in the target population is uniquely identifiable by its unique ID number. Each ICS can thus be allocated a Sample Selection Number in each monitoring period, starting at 1 and increasing up to the total number of ICS in the Database for that pre-defined sampling frame. Applying the random number generators, the ICS can then be randomly chosen from the defined population up to the required sample size as calculated by the CME. **Sample Size (Required and Actual) for Parameter of Interest:** The sampling is applied to the following monitoring parameters: • $n_{y,j}$: Proportion of ICS still in operation • SS_y : The percentage of ongoing baseline stove use within the population of in-use ICS during a monitoring period. • $\eta_{new,i}$: Continuing efficiency of ICS The sample sizes were determined, separately for each parameter. First two parameters ($n_{y,j}$ and SS_y) are proportional values and the outcome of sample size calculation (required and actual samples) based on the considered confidence level and precision for both the parameters is presented below; **Required Samples** | **Actual**

Sample Size for $n_{y,j}$	Sample Size for SS_y	Samples ($n_{y,j}$, SSy)
96	188	251

In this regard, sample size calculation spreadsheet /14/ was checked and found correct as per registered monitoring plan. The precision achieved for $n_{y,j}$ is 1.10% and for SSy as 8.66% both being within allowed 10%.

The sample size for $\eta_{new,i}$ were determined based on the ICS model and its vintage across all CPAs. The sample size with the applied 95/10 confidence precision level is presented in the table below.

ICS Vintage	Sample size required	Actual sample size
Vintage 1	12	12
Vintage 2	8	9
Total	20	21

It is to be noted that the sample size calculated for $\eta_{new,i}$ was less than 30 for the ICS of vintage 1 and vintage 2. Since the parameter of interest ($\eta_{new,i}$) is a numeric mean, hence the required sample size (as mentioned in the above table) is calculated using the Student's t-distribution:

$$n = \left(\frac{t_{n-1} \times SD}{0.1 \times mean} \right)^2$$

It is confirmed that the sampling requirements were met for the ICS of vintage 1 and vintage 2. The actual surveyed ICS were either same or higher than the required number, as mentioned above. As these were based on sampling approach, the reliability of precision was checked and found [1.68% (Vintage 1), 2.43% (Vintage 2)] within the prescribed limit (<10%).

Sample selection:

The samples were randomly selected using a computerized randomizer tool in Microsoft excel, and the verification team has reviewed the calculation /14/. The samples were drawn from the complete sales databases.. Hence the verification team able to confirm that the samples are representative of the total population.

Implementation of survey:

For monitoring of the parameters $n_{y,i}$, and SS_y, the survey includes the question

- Is the ICS operational and in use?
- Is the baseline (replaced) stove is still being used in addition to ICS?

Based on interviews with the CME and surveyors during the site visit, in addition to simply asking this question to the end users, the surveyors were also trained to visually inspect the stoves to corroborate the responses received. Therefore, the implementation of survey was considered reliable. The entire length of survey is from 25/05/2015 to 03/06/2015 for the efficiency of stove whereas the survey for other parameters was done from 01/06/2015 to 05/06/2015.

Reliability and precision calculation:

The verification team has verified the sampling CER calcualion spreadsheets /13/ with the monitored data, where the actual achieved precision is calculated /13/ against the Guidelines outlined under "Standard for sampling and surveys for CDM project activities and programme of activities" /21/ and can confirm that the calculation of achieved reliability was done correctly.

The results for calculations are reproduced, as an example, in the table for parameter $n_{y,j}$:

Table: The sample size determined for $n_{y,j}$ (prior to survey)

Statistical terms/Parameter	Value	Source
The population size (N)	26,281	Database

	Overall proportion (p)	0.80	Mock Survey
	Confidence level	95%	Default
	z-value for level of confidence	1.96	Standard
	Precision	0.10	Standard
	Sample size (n)	**96**	Calculated

The following table represents precision achieved after the survey, as an example, for the same parameter of interest discussed above.

Table: Reliability for $n_{y,j}$ (after survey)

Statistical terms/Parameter	**Value**	**Source**
n	251	Actual values
Overall proportion (p)	99.20%	Actual values
Confidence level	1.96	Standard
Precision achieved	1.10%	Calculated
Is required precision achieved?	Ye	<10%

In the same manner, all parameters of interest are included in the Sample Size Calculator spreadsheet. These were checked for the input values as well as formula applied and were found consistent. The reliability (demonstration of precision achieved after the survey results) is depicted in the ER sheet /14/ corresponding to final Monitoring Report /10/, which were also found correct.

Based on the verified results the verification team found that the required precision is met in all the cases and therefore the survey results /23/ were directly used in the calculation of ERs.

Findings	CAR #1
Conclusion	The verification team confirmed that the sampling plan and the parameter values are in accordance with the monitoring plan provided in PoA DD /01/.

I.5. Compliance with the calibration frequency requirements for measuring instruments

Means of verification	The registered monitoring plan (of respective CPA DDs and PoA DD) does not state the calibration requirements for any of the parameter (Section I.4.2). However, as good practice, the verification team enquired information with regard to monitoring equipment viz., weighing balance and thermometer that were used to conduct the parameter "Efficiency of the new stove". As a result following information was verified;

Instrument	Model	Other details
Weighing Scale	Ohaus Portable Balances – SP – 6000	Range: up to13lbs or 6,000 grams (±1g) Calibration facility: within the instrument with known weights Calibration frequency: Not specified/as per user /28/ Date of purchase: 15/10/2013 /29/
Digital Thermometer	Fluke 51-2 Single Input Digital Thermometer	Thermocouple Type: Type K, Chromel Alumel, bead style Range: -40 °C to 260 °C (± 1.1°C) Calibration frequency: Annual /27/ Date of purchase: 14/03/2015 /30/

The weighing scale has no fixed timing for calibration and whenever user feels (from the history of reading) there is error in reading, they can calibrate it.

The thermometer equipment were used prior to 14/03/2016 i.e., within one year (from the date of purchase) as per the survey dates (25/05/2015 to 03/06/2015)

	/23/ and therefore it can be stated that these were in worthy state of use. The specification of equipment establish that the results are reliable. Therefore, appropriate QA/QC procedures have been followed for the monitoring parameters under discussion.
Findings	CL #1
Conclusion	The verification team confirm that CME applied good practices (as per manufacturer recommendation) while using the monitoring equipment and these were under the state of calibration. There is no specific requirement prescribed in this regard in the registered monitoring plan of monitoring methodology. Therefore, the approach presented by PP was accepted taking note of the fact that all above equipment were used within 1 year from the date of purchase and no calibration was necessary in this period.

I.6. Assessment of data and calculation of emission reductions or net removals

I.6.1. Calculation of baseline GHG emissions or baseline net GHG removals by sinks

Means of verification	The verification team verified that a) A complete set of data for the monitoring period was available for the monitoring period and the verification of each monitoring parameter is elaborated under Section I.4.2 of this report. The complete monitoring data is also presented in the corresponding ER sheet /13/ of final Monitoring Report /10/. b) The information provided in the monitoring report was cross checked with other sources, wherever appropriate and available, and such information is also included under Section I.4.2 of this report. . c) The calculations of baseline emissions as presented in the corresponding ER sheet of final Monitoring Report were checked and found to be consistent with the formulae and methods described in the registered monitoring plan of each CPA DD, PoA DD and the applied methodology. d) All assumptions used in the emission calculations were found appropriate and therefore justified e) Appropriate emission factors, IPCC default factors and other reference values have been correctly applied. This has also been elaborated under Section I.4.1 of this report. f) No standardized baseline was prescribed in the PoA DD and therefore it has not been applied. g) There is no pro-rate approach (para 402(g) of CDM VVS Version 09) was applied in the current monitoring period as entire monitoring period falls into period that is after the end of first commitment period of Kyoto Protocol. The following equations were used to determine the baseline emissions as provided in the monitoring report /10/ and applied in the corresponding ER sheet /13/. The expressions used were found consistent with the revised approved PoA DD /1/, CPA DDs /04, 06/ and the applied methodology AMS-II.G, version 05: $ER_y = B_{y,savings} \times f_{NRBy} \times NCV_{biomass} \times EF_{projected\_fossilfuel} \times N_{y,i} \times L$ Total biomass that is saved in tonnes during the monitoring year (y) $B_{y,\,savings}$, is calculated using the equation below: $$B_{y,savings} = B_{old} \cdot \left(1 - \frac{\eta_{old}}{\eta_{new}}\right)$$ Further the value of $B_{old,adjusted}$ is calculated separately as under:

$$B_{old,adjusted} = B_{old} \times \left[\frac{1.0471}{1 + (SS_y / 0.197) \times (1.0471 - 1)} \right]$$

Where,
0.197: percentage of households in the baseline study who use a second stove simultaneously at least once in a week
1.0471: multiple stove adjustment factor
B_{old} = 3.2558
SS_y= 32.93%

The value of $B_{old,adjusted}$ is arrived as 3.1603 tonnes as per the above equation.

Similarly the Quantity of woody biomass saved in tonnes per ICS ($B_{y,savings}$) for each vintage stoves is calculated as following:

For Vintage 1 ICS:
Efficiency of operational ICS: 0.2717
$B_{1,savings}$ = 3.1603 x [1 – (0.1/0.2717)]
= 1.9972 tonnes

For Vintage 2 ICS:
Efficiency of operational ICS: 0.2789
$B_{2,savings}$ = 3.1603 x [1 – (0.1/0.2789)]
= 2.0272 tonnes
It is important to state that all the stoves installed/distributed under each CPA has been categorized as per vintage. This is summarized in the table below;

Vintage (Type)	Explanation
Vintage 1	ICS upto 1 year ICS
Vintage 2	ICS upto 2 year ICS

Owing to the age of ICS, its efficiency may generally decrease over a period of time and therefore in order to discount that in the baseline emissions the total quantity of stoves as per relevant vintage is required. It has been verified that the corresponding ER sheet /13/ to the final Monitoring Report /10/ has considered the number of stoves as per the vintage and accordingly the efficiency of such stoves in the ER calculation for each CPA.

Findings	CAR #1
Conclusion	The verification team confirms that a) The complete data was available and is duly reported; b) As indicated above, the description with regard to cross-check of reported data is included under respective parameter (refer Section I.4.2 of this report); c) Appropriate methods and formulae for calculating baseline GHG emissions or baseline net GHG removals were followed; d) Appropriate emission factors, IPCC default factors and other reference values were correctly applied. e) There is no pro-rate approach (para 403(e) of CDM VVS Version 09) was applied in the current monitoring period as entire monitoring period falls into period that is after the end of first commitment period of Kyoto Protocol.

I.6.2. Calculation of project GHG emissions or actual net GHG removals by sinks

Means of verification	The PoA DD, CPA DD and applied monitoring methodology does not prescribe any project emissions to be considered. The onsite visit and project design also did not reveal any potential source to be considered in this regard.
Findings	No finding was raised.
Conclusion	No project emissions were required to be calculated.

I.6.3. Calculation of leakage GHG emissions

Means of verification	The PoA DD, CPA DD and applied monitoring methodology does not prescribe any leakage emissions to be considered. The onsite visit and project design also did not reveal any potential source to be considered in this regard. However, the leakage adjustment factor that is required to adjust the baseline emissions has been duly accounted in baseline calculations.
Findings	No finding was raised.
Conclusion	No additional leakage emissions (other than what is already considered in baseline calculations) were required in accordance with the methodology AMS-II.G, version 05 /08/.

I.6.4. Summary of calculation of GHG emission reductions or net GHG removals by sinks

Means of verification	As elaborated above, the entire emission reductions from the PoA were based on baseline emissions. The calculations presented in this regard in the final monitoring report /10/ and corresponding ER sheet /13/ were found appropriate and complying with the provisions prescribed in the registered monitoring plan of respective CPA DD, PoA DD and applied methodology. The verification team confirms that an audit trail that contains the evidence and records that validated the stated figures were checked and found acceptable.
Findings	No finding was raised.
Conclusion	The verification team confirms that a) The complete data was available and is duly reported; b) As indicated above, the description with regard to cross-check of reported data is included under respective parameter (refer Section I.4.2 of this report); c) Appropriate methods and formulae for calculating baseline GHG emissions or baseline net GHG removals, project emissions and leakage emissions were followed; d) Appropriate emission factors, IPCC default factors and other reference values were correctly applied. e) There is no pro-rate approach (para 403(e) of CDM VVS Version 09) was applied in the current monitoring period as entire monitoring period falls into period that is after the end of first commitment period of Kyoto Protocol. The total number of ERs achieved during the current monitoring period is 41,606 tCO2e.

Specific-case CPA reference number	Baseline emissions or baseline net GHG removals by sinks (tCO_2e)	Project emissions or actual net GHG removals by sinks (tCO_2e)	Leakage (tCO_2e)	GHG emission reductions or net GHG removals by sinks (tCO_2e) achieved in the monitoring period		
				Results achieved in the period up to 31 December 2012	Results achieved in the period from 1 January 2013 onwards	Results achieved in the entire monitoring period
9558-0001	37,637	0	0	0	37,637	37,637
9558-0002	3,969	0	0	0	3,969	3,969
Total	41,606	0	0	0	41,606	41,606

I.6.5. Comparison of actual GHG emission reductions or net GHG removals by sinks with estimates in included specific-case CPA

Means of verification	As verified and evident from the final Monitoring Report /10/ and corresponding ER sheet /13/, the actual emission reductions achieved by each CPA that is included in the current monitoring period were found less than the estimated quantity in the respective CPA DDs for the comparable period. This is largely due to lower number of ICS installed/distributed and shorter operational days of ICS due to the fact that not every ICS operate for the full length of monitoring period. Considering, there is no increase in ERs no further verification effort was put in. The quantitative details of actual values of achieved ERs for each CPA and value estimated in the specific CPA DD is presented in the next table.
Findings	No finding was raised.
Conclusion	The actual emission reductions achieved in each specific CPA DD are not higher than the estimated quantity of ERs in the respective CPA DDs. Accordingly, it was accepted by the verification team.

Specific-case CPA reference number	Value estimated in ex ante calculation in the included specific-case CPA-DD(s)	Actual values achieved by the specific-case CPA(s) during this monitoring period
9558-0001	56,527 tCO2e	37,637 tCO2e
9558-0002	23,102 tCO2e	3,969 tCO2e
Total	79,629 tCO2e	41,606 tCO2e

I.6.6. Remarks on difference from estimated value in registered PDD

Means of verification	The actual emission reductions were less than the estimation in the CPA-DDs for an equivalent length of the monitoring period therefore no further explanation is required.
Findings	No finding was raised.
Conclusion	The actual ERs are less than the estimated quantity of ERs as given in the respective CPA DD, which is appropriate and accepted.

Appendix 1. Abbreviations

Abbreviations	Full texts
AQL	Acceptable Quality Level
BE	Baseline Emission(s)
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CDM PCP	Clean Development Mechanism Project Cycle Procedure
CDM PS	Clean Development Mechanism Project Standard
CDM VVS	Clean Development Mechanism Validation and Verification Standard
CER	Certified Emission Reduction(s)
CL	Clarification Request
CME	Coordinating or Managing Entity
CPA	Component Project Activity
CP	Crediting Period
DOE	Designated Operational Entity
DNA	Designated National Authority
DD	Design Document
DR	Desk Review
EB	Executive Board
EI	External Individual(s)
ER	Emission Reduction(s)
ESPL	Earthood Services Private Limited
FAR	Forward Action Request
GHG	Greenhouse Gas(es)
GWh	Giga Watt Hour (Thermal, in this document)
HH	Household(s)
ICS	Improved Cook Stove(s)
IPCC	Intergovernmental Panel on Climate Change
IR	Internal Resource(s)
KP	Kyoto Protocol
LE	Leakage Emission(s)
MP	Monitoring Period
MR	Monitoring Report
NA	Not Applicable
ODK	Open Data Kit
PE	Project Emissions
PoA	Programme of Activities
PRC	Post-registration change(s)
QA/QC	Quality Assurance/Quality Control
RMP	Revised Monitoring Plan
SV	Site Visit
SMS	Short Message Service (Tex Messages)
Tco2e	tonnes of Carbon dioxide equivalent
TA	Technical Area (with in Sectoral Scope)
TLC	Total Land Care
TR	Technical Reviewer
UNFCCC	United Nations Framework Convention on Climate Change
UQL	Unacceptable Quality Level
WBT	Water Boiling Test

Appendix 2. Competence of team members and technical reviewers

Competence Statement			
Name	Ashok Gautam		
Country	India		
Education	M. Sc. (Environmental Sciences) M. Tech. (Energy & Environmental Management)		
Experience	14 Years		
Field	Energy, Climate Change & Environment		
Approved Roles			
Team Leader	YES		
Validator	YES		
Verifier	YES		
Financial Expert	NO		
Technical Reviewer	YES		
TA Expert (1.1)	YES		
TA Expert (3.1)	YES		
TA Expert (13.1)	YES		
Reviewed by	Abhishek Mahawar	**Date**	29/12/2014
Approved by	Kaviraj Singh	**Date**	29/12/2014

Competence Statement			
Name	Ravi Kant Soni		
Country	India		
Education	B. Tech. (Mechanical Engineering) M. Tech. (Energy Management)		
Experience	7 Years		
Field	Energy and Climate Change		
Approved Roles			
Team Leader	YES		
Validator	YES		
Verifier	YES		
Financial Expert	NO		
Technical Reviewer	YES		
TA Expert (1.2)	YES		
Reviewed by	Abhishek Mahawar	**Date**	01/07/2015
Approved by	Kaviraj Singh	**Date**	01/07/2015

Competence Statement	
Name	Abhishek Mahawar
Country	India

Education	B. Tech. (Chemical Engineering) MBA (Finance)		
Experience	7 Years		
Field	Climate Change & Environment		
Approved Roles			
Team Leader	YES		
Validator	YES		
Verifier	YES		
Financial Expert	YES		
Technical Reviewer	YES		
TA Expert (1.2)	YES		
Reviewed by	Ashok Gautam	**Date**	29/12/2014
Approved by	Kaviraj Singh	**Date**	29/12/2014

Competence Statement			
Name	Ashu Sharma		
Country	India		
Education	Masters (Energy Management), DAVV Indore Masters (Physics), CCS University Meerut		
Experience	12+ Years in energy audit and insulations		
Field	Energy & Insulation		
Approved Roles			
Team Leader	NO		
Validator	NO		
Verifier	NO		
Financial Expert	NO		
Technical Reviewer	NO		
TA Expert (3.1)	YES		
Reviewed by	Abhishek Mahawar	**Date**	30/04/2014
Approved by	Ashok K Gautam	**Date**	30/04/2014

Appendix 3. Documents reviewed or referenced

No.	Author	Title	References to the document	Provider
01	CME	Revised approved PoA DD (latest)	Version 11, 27/04/2015	Others
02	TUV Sud	Validation Report (Registered PoA DD and CPA 1 DD)	Rev. 06, 10/03/2014	Others
03	ESPL	Validation Report on PRC (PoA DD and CPA DD 1, 2 and 3)	Rev. 02, 10/06/2015	Others
04	CME	Revised approved CPA DD – CPA 9558-0001	Version 11, 10/05/2015	Others

05	TUV Sud	Validation Report – CPA 9558-0001	Rev. 06, 10/03/2014	Others
06	CME	Revised approved CPA DD – CPA 9558-0002	Version 5, 10/05/2015	Others
07	TUV Sud	Validation Report – CPA 9558-0002	Rev 1, 24/09/2014	Others
08	UNFCCC	Methodology: AMS II.G	Version 05	Others
09	CME	Monitoring Report (publication)	Version 1, 25/06/2015	CME
09.1	CME	Monitoring report (Intermediate versions)	Version 02,dated 30/08/2015	CME
10	CME	Monitoring Report (final)	Version 03,dated 19/09/2015	CME
11	CME	ER calculations spreadsheet (Initially submitted)	-	CME
12	CME	ER calculations spreadsheet (Intermediate versions)	-	CME
13	CME	ER calculations spreadsheet (Final)	-	CME
14	CME	Sample size calculation sheet	-	CME
15	UNFCCC	PoA web page (UNFCCC)	-	Others
16	UNFCCC	CDM VVS	Version 9	Others
17	UNFCCC	CDM PS	Version 9	Others
18	UNFCCC	CDM PCP	Version 9	Others
19	UNFCCC	Glossary of CDM terms	version 08.0	Others
20	UNFCCC	Standard: Sampling and surveys for CDM project activities and programme of activities	Version 4.1	Others
21	UNFCCC	Guideline: Sampling and surveys for CDM project activities and programme of activities	Version 3.0	Others
22	CME	ICS Registration Database (Installation date and Registration date) – spreadsheet extracted from ODK (open data kit – mobile app)	-	CME
23	CME	Survey and WBT results	-	CME
24	CME	Mock/Pilot Survey Results	-	CME
25	CME	Monitoring survey questionnaire template	-	CME
26	Global Alliance for Clean Cookstoves	The Water Boiling Test Protocol	Version 4.2.2	Others
27	Fluke	Manual – Digital Thermometer	Fluke 51-52 Series	CME
28	Ohaus Corporation	Manual – Weighing Scale	SP – 6000 (Sold by Nevada Weighing LLC)	CME
29	CME	Purchase Order (Weighting Scale)	dated 15/10/2013	CME
30	CME	Purchase Order (Digital Thermometer)	dated 14/03/2015	CME
31	CME	Sample Scanned copies of sales receipts and registration cards	-	CME
32	ESPL	DOE Field Survey	-	CME
33	CME	Sample Photos of the ICS with Unique Serial Number	-	CME
34	IPCC	IPCC Defaults	2006	Others
35	CME	Snap shots of Registration Process through ODK - app	-	CME

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

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

No findings from validation.

Table 2. CL from this verification

CL ID	01	**Section no.**	I.4.2	**Date:** 11/08/2015
Description of CL				
• Monitoring frequency for the parameters mentioned under section G.2 of the MR is not consistent with the revised approved PDD/Included CPA- DDs. • Information about the equipment's used for WBT is not provided in the MR.				
CME response				**Date:** 30/08/2015
The same is now corrected as per the registered PoA DD. Equipment's used for WBT are as follows: 1. Electronic Scale 2. Thermometer 3. At least 3 kilos of testing wood per test 4. 10L or more of room-temperature water 5. Tools for removing charcoal (tongs, spatula) 6. Heat resistant gloves **The same is now inserted as footnote in section G.2.**				
Documentation provided by the CME				
Revised MR version 02,dated 30/08/2015 and corresponding ER sheet				
DOE assessment				**Date:** 08/09/2015
1) Further clarification is required as there the recording frequency is annual, whereas there is only one result presented, without giving further explanation in this regard. (in particular for CPA 1) 2) Please provide supporting documents for calibration details (of key equipment) for the monitoring equipment used if the test were not conducted by third party.				
CME response				**Date:** 19/09/2015

1. As mentioned in the PoA DD (page 35) & CPA1 DD (page 27) and also as per Methodology AMS-II.G version 05, the monitoring frequency chosen was biennial to achieve a 95/10 confidence/precision level during the current monitoring period. Only one result was presented in this monitoring period since the monitoring was done biennially. The frequency was mistakenly mentioned as annual in the PoA DD. Now in the revised MR the same is corrected.
2. Among various equipment used for WBT, two equipment requires calibration. These are, weighing scale and digital thermometer.

Weighing Scale

a. Model Used: Ohaus Portable Balances – SP – 6000 (Sold by Nevada Weighing LLC)
b. Buying date: October 15, 2013
c. Calibration Type: Digital Calibration from Keypad (Page 4 of Manual)
d. Calibration Frequency: NA

The Ohaus scout pro 6000 model has a capacity to weigh up to 13lbs or 6,000 grams. It has precisions or accuracies/readability of 1 gram and can be calibrated with a calibration weight (that comes as a freebie) using its own digital keypad. It is well known fact that for this type of balance there is no fixed timing for calibration and whenever user feels (from the history of reading) there is error in reading, they can calibrate it.

Digital Thermometer

a. Model Used: Fluke 51-2 Single Input Digital Thermometer, 3 AA Battery, -418 to 2501 Degree F Range, 60 Hz Noise Rejection
b. Buying date: March 14, 2015
c. Calibration Type: Manual
d. Calibration Frequency: Annual (Page no 13 of User's Manual)

This thermometer needs to be calibrated annually and since the thermometer was brought on 14/03/2015 and the WBT tests were carried out from 25/05/2015 to 02/06/2015, the calibration was not needed. CME will carry out the calibration as mandated in the Service Manual (Page 15) of the equipment.
The equipment purchase receipts are now submitted to DOE along with their User's manual.

Documentation provided by the CME	
Revised MR version 03,dated 19/09/2015 corresponding ER sheet	
DOE assessment	**Date:** 25/09/2015
1) The monitoring frequency has been appropriately updated. Closed. 2) The CME has provided sufficient details with regard to monitoring equipment and same is acceptable. Closed.	

Table 3. CAR from this verification

CAR ID	01	**Section no.**	I.4.2, I.4.3	**Date:** 11/08/2015
Description of CAR				
1) The dates of survey conducted for all three parameters is not clearly mentioned in the MR (P.4). 2) As per the sampling data analysis sheet only 12 household are selected for WBT analysis. Please clarify how the chosen sample size is accordance with the guidelines provided under paragraph 12 of standard for sampling surveys, version 4.1.Also justify the sample size selected for other 2 parameters (SS_y and $n_{y,j}$) 3) Please clarify how the vintage 1 and vintage 2 is determined. 4) The post registration changes are already approved, please clarify why the information in the relevant sections of MR is not updated.				
CME response				**Date:** 30/08/2015

1. **The dates of the survey are clearly mentioned in section D.1 of the MR.**
2.

i) Para 12 of "Sampling and surveys for CDM project activities and programme of activities; Version 04.1" says "*If the sample size calculation returns a value of less than 30 samples, a minimum sample size of 30 shall be chosen when the parameter of interest is a proportion. If the parameter of interest is a numeric mean value (i.e. not a proportion or percentage) the Student's t-distribution shall be used if the resulting sample size is less than 30.*

For η_{new} (WBT Test), as the parameter is the numeric mean value, if the sample size calculated from simple random sampling formula is less than 30, PP shall apply the ***Student's t-distribution*** to determine the sample size**.** We have applied it in our sample size calculation and it is OK to have sample size less than 30 when Student's t-distribution is used. In other words, if sample size obtained from simple random sampling formula is less than 30 and PP choose not to use ***t-distribution,*** and then PP must increase the sample size to minimum 30. This is an alternative if PP opts not to use t-distribution. For example, if PP get 25 samples from sample size formula, without applying t-distribution PP can add another 5 sample to meet the min 30.

That the η_{new} is a mean value parameter can be ascertained from point 3.3 (in Page 56) and the $n_{i,y}$ & SS_y are proportion parameters (points 3.1 & 3.2 in Page 54 & 55 respectively) of Gudieline: "Sampling and surveys for CDM project activities and programmes of activities, Version 3.1". Also page 33 of the same guideline explains the example of T-distribution.

ii) $n_{i,y}$ & SS_y are proportion parameters and thus t-distribution is not applicable here.

The sample size is calculated considering the Simple Random Sampling analysis. For the same a pilot study was carried out which gave us 33% of baseline stove still in use in the stove distributed area. The result of pilot study is now provided to DOE for verification.

The sample size calculation provides a sample size of 188. However keeping 30% non-response in mind, PP has come up with a sample size of 269. For analysis however we have used 251 samples to calculate $n_{i,y}$ & SS_y.

Documentation provided by the CME	
a) Revised MR version 02,dated 30/08/2015 b) Revised ER sheet, version 02,dated 30/08/2015	
DOE assessment	**Date:** 08/09/2015
i) The pilot study report is not provided to confirm the same **ii)** OK **iii)** Not replied by CME. Please also provide supporting evidences for installation date, registration date. (registration is important for implementation perspective and installation date for ER purposes as this date has been used for ER determinations, Please also explain the process of recording both the events in soft or electronic format given examples/evidences of some) **iv)** Information is updated in MR but date of approval is incorrect. Captions of Section C in MR are distorted.	
CME response	**Date:** 19/09/2015

1) The result of pilot study is now provided.
   – N/A
2) As per footnote 47 of POA-DD, Vintage shall be defined as the "age" of the ICS – ie. Number of years it has been in operation. – ie. all stoves below 1 year (or 365 days) of use belong to vintage 1, all stoves between 1 and below 2 years of use to vintage 2 and so on. Note that i will match the efficiency of the stove at a certain "age"; e.g. stoves vintage 2 will be grouped together and WBTs will dictate their $\eta_{new,y,i}$.

3) For conservative estimate of CER, Stoves are considered to be in operation since installation date. Therefor the period of vintage 1 is from installation date to "installation date + 364 days". The period for vintage2 is from "installation date +365 days "to "installation dates +729 days".

4) The supporting evidence for installation and registration is already provided to DOE in the format of screen shot of mobile devices used for registration. The data capturing was done electronically and the ODK process was shown to DOE. Also the weblink of electronic database which is the final outcome of electronic data capturing of stoves installed was provided to DOE. CME can't give a live example of data capturing of a particular stoves installed as that was a continuous process and has not been recorded. However every detail is available in the electronic database provided to DOE. A screenshot for TLC000509 which is the example used for vintage and ER calculation in MR is now submitted to DOE for ready reference.
5) Date of approval of PRC was considered as the one which shows the "effective approval date" which is now changed to 11/08/2015. Captions of Section C is now restored to its original format.

Documentation provided by the CME

a) Revised MR version 03,dated 19/09/2015
b) Revised ER sheet, version 03,dated 19/09/2015

DOE assessment	**Date:** 23/09/2015

a) The pilot study results were checked by the verification team and found to be consistent with values used in sample size calculation for each parameter of interest except the 'p' for 'ny'. The survey result indicated that 100% project ICS are in operation but CME conservatively considered 80% to be in use, while determining the sample size, taking note of quantum of ICS distributed as part of PoA. Same was accepted by the verification team. Closed.
b) The CME justified that the efficiency of ICS is not a proportion value, as per the referenced standard. For this parameter, the sample size was calculated using the Student's t-distribution method, which determined that a minimum sample size of 12 is required for vintage 1 stove and 8 for vintage 2. The CME presented the efficiency results for vintage 1 and 2 ICS as 12 and 9, respectively. The CME clarified that the response rate was fairly high and therefore once the minimum required number for each vintage ICS was achieved, it did not sample more. The verification team accepted the approach as the minimum required size as per Student's t-distribution was met. Closed.
c) The method of vintage classification has been explained by CME and found to be suitable and consistent with PoA DD. Closed.
d) The correct dates are now included in the relevant sections of MR, which is consistent with UN webpage. Closed.

CAR ID	02	**Section no.**	I.4.2	**Date: 11/08/2015**

Description of CAR

Sampling data and analysis sheet:

1) ny + SSy data tab**:** Few cells in column D,E is not filled

ER sheet:

ER sheet CPA 1 and ER CPA 2:

2) Specific monitoring period of CPAs is not mentioned.(row 2,3)
3) Column E: Duplicate serial numbers are identified for both CPAs. Please clarify how the number of stoves counted under CPAs are correct.

CME response	**Date:** 30/08/2015

1. Column D and E is now filled with complete data
2. Specific monitoring period is mentioned for each CPA
3. Duplicate serial numbers are error due to printing errors. Since different teams were involved for distribution and registration of stoves, these errors were not spotted in the early stage of the project. Also during registration the field executive use to enter the data in-situ including the serial numbers. During compilation of the electronic database and during quality check, these errors were observed by the PP. These duplicates are only on serial numbers, if the contact detail and GPS co-ordinates are observed for these duplicates, it will show their unique identification for each duplicates observed. PP also found few triplicate, quadruplicate and quintuplicates. Those were also now stands corrected. Since the correction of the serial numbers need both manpower and time, PP didn't have time to correct these errors at the time of submission of this database to DOE considering the fact that the database was of stove registration upto 15/06/2015. The correction is going on and it will take a longer time. PP hereby assures DOE that all these corrections in Serial Number will be completed by end of December, 2015. A declaration on the same with new serial numbers those will replace the duplicate serial numbers are provided herewith.

   Also the database with new serial numbers is provided to DOE for consideration.

Documentation provided by the CME

a) Revised MR version 02,dated 30/08/2015
b) Revised ER sheet version 02,dated 30/08/2015

DOE assessment	**Date:** 08/09/2015

1) Please also provide supporting documents for actual survey conducted by CME for all the parameters. (around 20 each for ny + SSy and all for efficiency of ICS)
2) The number of ICS distributed in ER sheet is inconsistent with the sample size calculator
3) The date of proposing correction is given as end of Dec 2015 in this response and Apr 2016 in the declaration letter. The new issued numbers are either incomplete or duplicate. There are some/few ICS whose serial number has been changed, which were not even duplicate. The team reviewed the issuance of new serial numbers, CME has not provided an approach as how to prevent this error in future. CME shall, additionally, adequately explain how this error occurred and how it impacts the ER determination for these stoves.
4) (Newly added). As per CPA DD's, the stoves upto 50,000 will be only be numeric, which is also consistent on ground. However, the ER sheet for CPA 1 and 2 indicates that all serial number are alphanumeric (all begin with TLCXXXXX).

CME response	**Date:** 19/09/2015

1. Supporting documents for survey is now shared with DOE. Due to large file size the same is now shared through Dropbox.
2. The same is now made consistent and also the sample size calculation is now reviewed, however there is no change in the total number of samples worked out for all the parameters.
3. The date of completion of correction is indeed April 2016. It was mistakenly mentioned as December 2016.

   The correction shown on serial number which is not due to duplicate error is part of finding from the Quality Control system implemented by CPA implementer as explained under monitoring system in Section F of monitoring report - *CPA-I: Data logged into database and CPA-I: Spot- checking (ongoing).*

In actual, no new serial numbers have been issued to the database for this error. The error is due to the typo on manual filling of serial numbers into the PDA during the registration process. Thus the corrected serial numbers shown on the database is the actual serial numbers given to the household during the registration process.

On the issue how to prevent this error, due to the handling of large volume of data, human error is unavoided. Finding an error on the database is not a worst case because the mistake itself reveals that the Quality Control system is in place and working well to detect the mistake on database. Then a proper action can be taken to fix the error and database can be always maintained at good quality. At the present, only a small volume of data was found with this error. Few measurements will be taken to reduce the error:

a. Frequent reminders will be given the field coordinator to remind them the requirement to enter the serial numbers correctly.
b. For the field coordinator who makes this error frequently, if needed they will be called back for a fresh data entry training again.
c. CPA implementer will continue to conduct the QC procedure as defined under monitoring system in Section F of monitoring report.

At the present, the CPA implementer is also studying the option to use the bar code on the registration process. Scanning the bar code given on the serial number plate and serial numbers will be automatically filled into PDA without any error. This will avoid the need to fill the serial numbers manually. However, this option is still under consideration as various factors have to be taken into account before actual implementation. This error has not caused negative impact to the ER determination. These stoves are real and there is no issue to identify it as each stove carries unique GPS coordinates. It also can be identified via user name and address (District, Traditional Authority, and Village).

That for up to 50,000 stoves the serial number will be only numeric can be seen in the stoves installed in the field. The sticker with serial numbers on stoves reflect the same. However since the automated data capturing by ODK has the alpha numeric number as default, whenever a field personal enters the stove serial number with only the numeric part, the serial number is being captured as alpha numeric numbers. Thus although in ground the numeric part of the serial numbers can be seen, in the database the alpha numeric numbers get recorded.

Documentation provided by the CME	
a) Revised MR version 03,dated 19/09/2015 b) Revised ER sheet version 03,dated 19/09/2015	
DOE assessment	**Date:** 23/09/2015

1) Finding is closed and the correction has been completed and supporting evidences received. Closed.

2) The revised files were reviewed by verification team and found consistent. Closed.

3) The review of revised ER sheet and CPA database files (in which a new unique number is given) indicates that this error is not limited to just a few (the affected ICS quantity is little less than 2000, which is significant). The errors may have been identified by the CME during their QA/QC procedures but these were still part of the initial ER sheet with which the current verification began. It also appears that the new serial number have been issued, considering most (except initial few) of the correct serial number begin at TLC075000 onwards. Therefore, it does not appear that these corrected numbers were initially allotted to these ICS. Therefore, further explanation is required as how CME has treated this anomaly in the CPA database in order to consider these ICS as part of emission reduction calculations and how does it comply with the intended implementation of registered monitoring plan of the PoA/CPA. Open.

4) The response by CME is partly correct that the actual serial number on ground is indeed numeric only upto 50000. In fact, if one leaves out the corrected new serial numbers, all the stoves are only numeric in serial numbers. However, the correction is not accepted as the reporting of serial number on ground is inconsistent with the record keeping system of the CME. The CME should explore other methods of correcting the database and resubmit the same to keep it consistent with what is on ground. Open.

CME response	**Date:** 25/09/2015

1) –
2) –
3) The purpose of the issuance of corrected serial numbers those ranges from TLC075000 to TLC076944, is to fix the duplicate due to error while issuing these serial numbers to the field staff. These were not the initial numbers allotted to the ICS as the initial serial numbers contain duplicate error.
   In CME view, as new serial numbers have been issued to replace the duplicate, therefore each ICS as registered in CPA database will carry a unique serial number which is in line with the PoA requirement. Hence it is appropriate to include these ICS as part of emission reduction calculations.

   CME does not foresee any issue for the CPA database to comply with registered monitoring plan as the duplicate issue is fixed with issuance of new serial numbers. Furthermore, the present database which serves as the primary sampling unit (for sampling purpose) captures complete information collected. However effort is being made so that duplicate serial numbers can't be registered into the ODK. Thus even if CME mistakenly issues duplicate serial numbers to field stuffs, once a serial number is entered by one field staff/team, the other will be unable to enter the same through the ODK. This will definitely help in preventing duplication.

4) Although the alpha numeric serial numbers were planned to identify the stoves installed in the initial stage of the PoA implementation, mistakenly implementer assigned only the numeric serial numbers to the distributed stoves. Thus as per a PRC approved on 11/08/2015, for the first 50,000 stoves installed the serial numbers will be only of numeric in nature. However the registration process that involves ODK which is programmed to produce alpha characters 'TLC' before the numeric values of serial numbers, registers the alpha numeric serial numbers of the stoves in the database. This database is being maintained by Agrotech, a third party and is programed as un-editable, which made it tamperproof from anyone working on this database. Now to change something in this database and specially the serial numbers, would require a new registration for all the stoves by the field staffs which again will lead to a new registration date for the installed stoves. However the electronic database through ODK can be downloaded to an excel file and CME for more clarity has introduced a new column along with the original serial numbers registered in the database in which the serial numbers will have only numerical characters as seen in the field by the verifier. The new column has the same serial numbers shun the alpha character "TLC". The revised excel database and ER sheet is now submitted to DOE.

Documentation provided by the CME
Revised ER sheet and database.

DOE assessment	**Date:** 27/09/2015

1) Closed earlier.
2) Closed earlier.
3) Based on the response provided by CME, the verification has accepted the approach. The revised documentation now presents the unique number of stove as seen during the site visit except the ones where errors have been found. The CME plans to complete this exercise in the future period. The verification team closed out the finding as all the ICS are unique based on other values recorded in the registration process e.g., unique geo coordinates and user name etc. However, as the actual correction on ground can not be verified at this stage, the verification team has raised a FAR in this regard.
4) Based on the response provided by CME, the revised ER sheet is accepted as it clearly mentions the unique serial number as can be seen on ground, in the database and corrected column. Considering the electronic database platform is un-editable to remove the TLC that is automatically inserted due to functionality constraint, the revised approach where the spreadsheet contains correct unique serial number is accepted. The finding is closed.

Table 4. FAR from this verification

FAR ID	01	**Section No.**	I.1	**Date:** 23/09/2015
Description of FAR				
The verifying DOE prior to completing the next verification shall check whether the serial numbers of ICS mentioned in column G of worksheet “ER sheet CPA 1” and “ER sheet CPA 2” have been corrected by issuing new labels.				
CME response				**Date:** DD/MM/YYYY
To be provided during next verification				
Documentation provided by the CME				
To be provided during next verification				
DOE assessment				**Date:** DD/MM/YYYY
To be provided during next verification				

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