



**Verification and certification report form for CDM programme of activities**  
(version 01.0)

**VERIFICATION AND CERTIFICATION REPORT**

<b>Title of the programme of activities (PoA)</b>	Improved Cookstoves Program for Malawi and cross-border regions of Mozambique	
<b>UNFCCC reference number of the PoA</b>	9558	
<b>Version number(s) of the PoA-DD(s) applicable to this report</b>	Version 11	
<b>Version number of the verification and certification report</b>	3	
<b>Completion date of the verification and certification report</b>	28/10/2016	
<b>Monitoring period number</b>	Second Monitoring Period	
<b>Duration of this monitoring period</b>	16/06/2015 - 31/05/2016 (both days inclusive)	
<b>Number and version number of the monitoring report to which this report applies</b>	Monitoring report number 1 Monitoring Report Version 03	
<b>Coordinating/managing entity (CME)</b>	C-Quest Capital Malaysia Global Stoves Limited (CQC)	
<b>Host Party(ies)</b>	Host Party(ies) of the PoA	Is this a host Party to a CPA covered in this report? (yes/no)
	Malawi	Yes
<b>Sectoral scope(s)</b>	Scope 3: Energy demand	
<b>Selected methodology(ies)</b>	AMS-II.G. Version 05	
<b>Selected standardized baseline(s)</b>	Not Applicable	
<b>Total estimated GHG emission reductions or net GHG removals for this monitoring period in the included CPA(s) covered in this report</b>	113,913 tCO <sub>2</sub> e	
<b>Total certified GHG emission reductions or net GHG removals for this monitoring period for the included CPA(s) covered in this report</b>	99,940 tCO <sub>2</sub> e	
<b>Name of DOE</b>	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**

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The registered PoA involves the dissemination (distribution/installation) of TLC Rocket fixed improved cooking stoves (ICS) in Malawi, later on the stoves will also be distributed in cross-border regions in Mozambique. The ICS disseminated through this programme has replaced the prevailing inefficient three-stone fire stove or traditional pot supports, which combust wood more efficiently, and improve thermal transfer to pots, hence saving fuel and lowering greenhouse gas emissions. This monitoring period includes the implementation and monitoring of all three included CPAs (i.e. 9558-0001, 9558-0002 and 9558-0003) as part of registered PoA within the geographical boundary of Malawi.

Detailed implementation status of these 3 implemented CPAs has been discussed in subsequent sections of this report and CME has also reported the same in monitoring report, thus complying with §244(b) of PS, V9 and §383 of VVS, V9.

Earthood Services Private Limited has performed the second verification of the CDM PoA “Improved Cookstoves Program for Malawi and cross-border regions of Mozambique” and UNFCCC PoA Reference Number 9558. The verification includes confirming the implementation of the monitoring plan of the revised approved PoA-DD, CPA-DDs and the application of the monitoring methodology as per AMS-II.G., Version05. A site visit was conducted to check the implementation of registered monitoring plan and verify the data submitted in the monitoring report.

ESPL confirms the following has been reviewed;

- (a) The revised approved PoA-DD, CPA-DDs and the monitoring plan, and the corresponding validation opinion;
- (b) The PRC validation report and 1<sup>st</sup> MP verification report;
- (c) The applied monitoring methodology;
- (d) The monitoring report to verify that it is as per the standardized format;
- (e) CER calculations sheets and all supporting documents;
- (f) Any other information and references relevant to the project activity's emission reductions;
- (g) Relevant decisions, clarifications and guidance from the CMP and the CDM Executive Board;

Earthood Services Private Limited confirms that the monitoring system is in place and the emission reductions are calculated without material misstatements.

**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, Verifier and Technical Expert (TA 3.1)	EI	Joshi	Akhilesh	Central office	✓	✓	✓	✓
2.	Local Expert (Malawi)	EI	Katundu	Enea	Central office		✓	✓	✓

**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 and Technical Expert (TA 3.1)	IR	Deka	Nayan Jyoti	Central office
2.	Approver	IR	Singh	Dr. Kaviraj	Central office

**SECTION C. Means of verification****C.1. Desk review**

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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: 22/07/2016 to 24/07/2016				
No.	Activity performed on-site	Site location	Date	Team member
1.	Implementation and Operation of the CDM programme of activity based on registered Monitoring Plan and physical features of the project activity as per approved POA-DD and CPA-DDs	Salima, Dowa and Kasungu District of Central Region of Malawi; Mzimba and Rumphi District of Northern Region of Malawi; Chiradzulu and Zomba District of Southern Region of Malawi	22/07/2016 to 24/07/2016	Akhilesh Joshi and Enea Katundu
2.	Information flows for generating, aggregating and reporting the monitoring parameters			
3.	Competency of the operating personnel, monitoring personnel and calibrating agencies			
4.	Data collection procedures			
5.	Calibration performance and monitoring practices followed for monitoring equipment's used in the project activity			
6.	Quality Control and Quality Assurance procedures against the approved monitoring plan			
7.	Calculation and assumptions made in determining the GHG data and emission reductions			
8.	Compliance with CDM criterion and relevant guidance with respect to monitoring plan			
9.	Physical site visit : Households visited (Implementation of PoA)			

**C.3. Interviews**

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1.	Msachiwa	Onyx	Total Land Care	22/07/2016 – 24/07/2016	Implementati on of CPAs, monitoring activities, record keeping	Akhilesh Joshi
2.	Kowalke	Jordan				
3.	Njikho	Matias				
4.	Goudwe	Vincent				
5.	Muyeye	Steven				
6.	Katsonga	Glyness			Ex post Monitoring Survey	
7.	Chisui	Mathews				
8.	Garg	Vineet Kumar	CQC	06/08/2016	Corrections in MR and ER sheet	Akhilesh Joshi
9.	Goswami	Tridip Kumar	CQC	22/07/2016 – 24/07/2016	Sampling approach, results and ER calculations	Akhilesh Joshi
10.	Akimu	Lidia	Independent household representative	22/07/2016 – 24/07/2016	DOE Field Survey of ICS Users (Salima, Dowa and Kasungu District of Central Region of Malawi; Mzimba and Rumphi District of Northern Region of Malawi; Chiradzulu and Zomba District of Southern Region of Malawi)	Akhilesh Joshi, EneaKatundu
11.	Kwacha	Joyce				
12.	Kanero	Gladys				
13.	Matiki	Modesita				
14.	Robert	Hana				
15.	Lungu	Emily				
16.	Kaira	Catherne				
17.	Gondwe	Cecelia				
18.	Phiri	Ida				
19.	Suwedi	Funny				
20.	James	Rosinati				
21.	Enelesi	Chimowa				
22.	Dalisoni	Grace				
23.	Chabwera	Alinafe				
24.	Enelesi	Christopher				
25..	Haswell	Getrude				
26.	Simchoka	Melina				
27.	Pitani	Nelesi				
28.	Lomani	Agnes				
29.	Sandifolo	Mafulu				
30.	Kefa	Inga				
31.	Doloko	Patricia				
32.	Phiri	Taleza				
33.	Phiri	Snodia				
34.	Mwale	Christina				
35.	Kwende	Loness				
36.	Khoma	Olipa				
37.	Kawawanga	Magret				

**C.4. Sampling approach****CME's sampling approach:**

The CME has applied a sampling approach as per approved revised PoA-DD<sup>12/</sup> and CPA-DDs<sup>12/</sup>. A confidence precision 95/10 was applied by CME in the sampling, which is appropriate given the length of the monitoring period. The sampling approach undertaken by CME is duly explained under Section B.2 of monitoring report<sup>12/</sup>.

**DOE's sampling approach:**

In order to meet the requirements of §23 and 24 of Standard for "Sampling and surveys for CDM project activities and programmes of activities", Version 05<sup>24/</sup>, the verification team applied acceptance sampling in the verification (in accordance with §26<sup>24/</sup>). The verification team selected random sample of CME's sampled

records, checked 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 for "Sampling and surveys for CDM project activities and programmes of activities", Version 05<sup>/24/</sup>:

- The proportion of discrepancies between the CME's sample records and DOE's (field or onsite inspection results) sample records 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 sample records and DOE's (field or onsite inspection results) sample records that would be considered unacceptable. This is the UQL (Unacceptable Quality Level): 20% was considered in this verification.
- The producer risk and consumer risk: 5% was considered for both.

Considering the above input values, a sample size of 22 was required as per Table 1 in the Standard for "Sampling and surveys for CDM project activities and programmes of activities", Version 05<sup>/24/</sup>.

Accordingly, Acceptance number (c) thus determined for the sample size is 1. A sample size of 22 meets the criteria. Therefore, the verification team together verified the 28 samples (taking six additional samples in order to meet minimum requirement of 22 samples) during site visit and observed that all the stoves checked were in operation (100%) as against the surveyed results, which indicates 99.15%, 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<sup>/2/</sup> and ER sheet<sup>/3/</sup>. Thus, CME's set of records has been accepted in line with §30 of the Standard for "Sampling and surveys for CDM project activities and programmes of activities", Version 05<sup>/24/</sup>.

The verification team together verified the 28 samples (taking six additional samples in order to meet minimum requirement of 22 samples) during site visit and observed that all the results reported by CME for use of baseline stove were consistent with the survey results. 4 out of 28 users found using traditional stoves along with ICS, which means that 14.28% users still using traditional or Baseline stoves. However, CME has considered value of SS<sub>as</sub> 31.06%, which is higher than the DOE onsite survey results. As there were no discrepant records CME's set of samples were accepted in line with §30 of the Standard for "Sampling and surveys for CDM project activities and programmes of activities", Version 05<sup>/24/</sup>.

There was no DOE field survey conducted for efficiency related parameter as these were checked with the WBT records retained by the CME; however verification team physically checked 15 ICS having conducted WBT test during on site visit. The records were consistent with the reported results. The verification team randomly selected 20% of CME's WBT results and found them 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
<b>General</b>			
Compliance of the monitoring report with the monitoring report form	0	0	0
Remaining forward action requests from validation and/or previous verification	0	1	0
Specific-case CPA(s) considered for verification and covered in this report	0	0	0
<b>Programme of activities</b>			
Compliance of the programme implementation with the registered PoA-DD	0	0	0
Implementation and operation of the management system	0	0	0
Post-registration changes			
<ul style="list-style-type: none"> <li>• Temporary deviations from the registered monitoring plan, monitoring methodology or standardized baseline</li> </ul>	0	0	0

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• Corrections	0	0	0
• Inclusion of a monitoring plan in a registered PoA-DD (including its generic CPA-DD(s))	0	0	0
• Permanent changes to the monitoring plan as described in the registered PoA-DD, applied methodology, or applied standardized baseline	0	0	0
• 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	0	0	0
• Types of changes specific to afforestation and reforestation activities	0	0	0
<b>Component project activity(ies)</b>			
Compliance of the CPA implementation with the included CPA design document	0	1	0
Post-registration changes			
• Temporary deviations from registered monitoring plan, applied methodology or applied standardized baseline	0	0	0
• Corrections	0	0	0
• Changes to the start date of the crediting period	0	0	0
• Inclusion of a monitoring plan to an included CPA-DD	0	0	0
• Permanent changes to the monitoring plan as described in the included CPA-DD, applied methodology, or applied standardized baseline	0	0	0
• Changes to the programme design of the included CPA-DD	0	0	0
• Types of changes specific to afforestation and reforestation component project activities	0	0	0
Compliance of the monitoring plan with the monitoring methodology including applicable tool and standardized baseline	1	0	0
Compliance of monitoring activities with the registered monitoring plan			
• Data and parameters fixed ex ante or at renewal of crediting period	0	0	0
• Data and parameters monitored	0	1	0
• Implementation of sampling plan	0	0	0
Compliance with the calibration frequency requirements for measuring instruments	0	1	0
Assessment of data and calculation of emission reductions or net removals			
• Calculation of baseline GHG emissions or baseline net GHG removals by sinks	0	1	0
• Calculation of project GHG emissions or actual net GHG removals by sinks	0	0	0
• Calculation of leakage GHG emissions	0	0	0
• Summary of calculation of GHG emission reductions or net GHG removals by sinks	0	0	0
• Comparison of actual GHG emission reductions or net GHG removals by sinks with estimates in included specific-case CPA	1	0	0
• Remarks on difference from estimated value in registered PDD	0	0	0
Others (please specify)	0	0	0
<b>Total</b>	<b>2</b>	<b>5</b>	<b>0</b>

**SECTION D. Internal quality control**

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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 was 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**

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Earthood Services Private Limited (ESPL), contracted by C-Quest Capital Malaysia Global Stoves Limited (CQC)(the CME for the PoA), has performed the second independent verification of the emission reductions for the registered CDM PoA9558“Improved Cookstoves Program for Malawi and cross-border regions of Mozambique” in Malawi for the monitoring period 16/06/2015to 31/05/2016 as reported in the Monitoring Report (public) Version 01 dated 10/06/2016. 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 all the CPAs (9558-0001, 9558-0002 and9558-0003), 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 all referred 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 § 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 was one (1) FAR raised during 1<sup>st</sup> MP verification of the project activity, which is addressed and successfully closed during this verification.

As a result, it is confirmed that the emission reductions as 99,940 tCO<sub>2</sub>e from the CDM PoA9558 “Improved Cookstoves Program for Malawi and cross-border regions of Mozambique” are correctly reported in the Monitoring Report (final) Version 03dated19/10/2016 and corresponding ER spreadsheet for the monitoring period 16/06/2015- 31/05/2016 (including both days). Therefore, this will be submitted as part of request for issuance as per CDM PCP Version 9.

**SECTION F. Certification statement**

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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 16/06/2015 - 31/05/2016 (including both days) are fairly stated in the Monitoring Report (final) Version 03 dated 19/10/2016.

ESPL, based on outcome of verification activities, certify in writing that, during the monitoring period 16/06/2015-31/05/2016 (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, 9558-0002 and 9558-0003) in the CDM PoA achieved the verified amount of 99,940 tCO<sub>2</sub>e 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;

CPAs (included in this Issuance request)	Emission Reductions achieved in this monitoring period	
	Up to 31/12/2012 (1 <sup>st</sup> commitment period)	01/01/2013 onwards (2 <sup>nd</sup> commitment period)
CPA 9558-0001	NIL	44,471
CPA 9558-0002	NIL	40,035
CPA 9558-0003	NIL	15,434
<b>Total</b>	<b>NIL</b>	<b>99,940</b>

## SECTION G. Verification findings - General

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

<b>Means of verification</b>	The verification team has compared the monitoring report <sup>2/</sup> with a latest applicable monitoring report form <sup>22/</sup> .
<b>Findings</b>	No finding has been raised.
<b>Conclusion</b>	The verification team confirms that the monitoring report has been appropriately prepared using the applicable monitoring report form <sup>22/</sup> , and that all sections are complete.

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

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There is one (1) pending FAR which was raised during 1<sup>st</sup> MP verification of the CDM PoA. 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. CAR-01 has been raised in this context. Please refer Appendix 4 for detailed resolution of FAR-01 (i.e. CAR-01).

### 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	Yes
9558-0002	Yes	Version 11, dated 27/04/2015	Yes
9558-0003	Yes	Version 11, dated 27/04/2015	No. This is 1 <sup>st</sup> verification of the CPA.

## SECTION H. Verification findings – Programme of activities

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

Means of verification	<p>The registered PoA involves the promotion, distribution and sale of improved cooking stoves (ICS) (i.e. TLC Rocket stove) in Malawi manufactured by CME through coordination with local/ channel sellers/ distributors e.g., Total Land Care. At later stage the stoves will also be distributed in cross-border regions in Mozambique. The overall responsibility of implementation and operation is with CME (CQC), which was also evident during the site visit. This is consistent with revised approved PoA-DD and CPA-DDs<sup>/12/</sup>.</p> <p>This monitoring period includes the implementation and monitoring of all three implemented CPAs (CPA 9558-0001, 9558-0002 and CPA 9558-0003) as part of PoA<sup>/18/</sup> (at the end of the current monitoring period) within the geographical boundary of Malawi (for CPA 9558-0001, 9558-0002 and CPA 9558-0003). The implementation of all implemented CPAs, as referenced above, are within the geographical boundary of the PoA-DD (Section A.5.)<sup>/12/</sup>, which constitutes the physical boundary of PoA as well.</p> <p>In the referenced CPAs, during the monitoring period, only one model of the improved cookstove (ICS) i.e., TLC Rocket Stove is deployed/installed/distributed. The distribution/ implementation of the ICS under three CPAs is done by the TLC who is the sole CPA implementer for this PoA.</p> <p>The stoves have been sold/distributed in altogether across the various districts of Northern, Central and Southern Region of Malawi. This was confirmed through the registration database of each CPA<sup>/5/</sup>.</p> <p>The total number of stoves that were sold/distributed at the end of the current monitoring period as per specific case CPA-DDs were verified as under;</p>															
	<table><tr><th>CPA Reference Number</th><th>Total installed ICS (TLC Rocket)</th><th>Estimated in CPA-DD</th></tr><tr><td>9558-0001</td><td>20,077</td><td>20,763</td></tr><tr><td>9558-0002</td><td>20,631</td><td>20,763</td></tr><tr><td>9558-0003</td><td>18,160</td><td>20,763</td></tr><tr><td>Total</td><td>58,868</td><td>62,289</td></tr></table>	CPA Reference Number	Total installed ICS (TLC Rocket)	Estimated in CPA-DD	9558-0001	20,077	20,763	9558-0002	20,631	20,763	9558-0003	18,160	20,763	Total	58,868	62,289
	CPA Reference Number	Total installed ICS (TLC Rocket)	Estimated in CPA-DD													
	9558-0001	20,077	20,763													
	9558-0002	20,631	20,763													
9558-0003	18,160	20,763														
Total	58,868	62,289														
<table><tr><th>CPA Reference Number</th><th>Date of Installation of 1<sup>st</sup> ICS</th><th>Date of registration (Earliest)</th></tr><tr><td>9558-0001</td><td>21/08/2013</td><td>20/10/2013</td></tr><tr><td>9558-0002</td><td>24/09/2013</td><td>10/12/2014</td></tr><tr><td>9558-0003</td><td>06/06/2015</td><td>20/10/2015</td></tr></table>	CPA Reference Number	Date of Installation of 1 <sup>st</sup> ICS	Date of registration (Earliest)	9558-0001	21/08/2013	20/10/2013	9558-0002	24/09/2013	10/12/2014	9558-0003	06/06/2015	20/10/2015				
CPA Reference Number	Date of Installation of 1 <sup>st</sup> ICS	Date of registration (Earliest)														
9558-0001	21/08/2013	20/10/2013														
9558-0002	24/09/2013	10/12/2014														
9558-0003	06/06/2015	20/10/2015														
<p>Therefore, the quantity, specification and target group of the ICS were found in accordance with the approved revised PoA-DD and respective CPA-DDs<sup>/12/</sup>. Further, based on the review of registration database of ICS<sup>/5/</sup>, 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 approved revised PoA-DD and respective CPA DDs<sup>/12/</sup>.</p>																
Findings	No finding has been raised.															

<b>Conclusion</b>	<p>The verification team confirms that -</p> <ul style="list-style-type: none"> <li>• The physical features (technology/type of ICS) of the implementation were in accordance with the approved revised PoA-DD<sup>/12/</sup>.</li> <li>• The distribution of ICS is still ongoing as it has not yet reached the estimated quantity given in the respective specific case CPA-DDs<sup>/12/</sup>.</li> <li>• The actual operation is in line to respective CPA-DDs, which is further explained under Section I.1 of this report.</li> <li>• No information with regard to data and variables was identified that may increase the estimated quantity of ERs in the respective CPA-DDs<sup>/12/</sup>.</li> <li>• The emission reductions achieved for each specific case CPA-DD were within the estimated quantity in the respective CPA-DDs<sup>/12/</sup> except CPA 9558-0001. This is further discussed in section I.6.5 of this report.</li> </ul>
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## H.2. Implementation and operation of the management system

<b>Means of verification</b>	<p>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.</p> <p>CPA Implementer field staff continually randomly selects households included in the database 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.</p> <p>The electronic databases<sup>/5/</sup> containing the monitored data were maintained by the CME. The database (and its backup) was 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 Washington D.C. Original copies of sales receipts/user agreements and completed survey forms and WBT test reports<sup>/6/</sup> is 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.</p>
<b>Findings</b>	No finding has been raised.
<b>Conclusion</b>	The verification team assessed the management systems in place to implement the monitoring of the PoA <sup>/12/</sup> . This included the roles and responsibilities, data collection, transfer and aggregation procedures, data storage and archiving for the monitoring system. This has been described in detail in the MR <sup>/2/</sup> . 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 current monitoring period.

**H.3.2. Corrections**

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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, since monitoring plan was included in the registered PoA-DD<sup>/12/</sup>.

**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 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**

<b>Means of verification</b>	<p>There are 03 specific CPAs (9558-0001, 9558-0002 and 9558-0003) included in the registered PoA<sup>/18/</sup> at the end of the current monitoring period and all are covered in the current monitoring period. The 3 implemented 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. C-Quest Capital Malaysia Global Stoves Limited (CQC) is the Coordinating and Managing Entity (CME) for the implementation of CPA. The CQC coordinates and manages each CPA Implementer and assists them in implementing each element of the monitoring plan. There are 28 districts under three regions (Southern, Central and Northern region) of Malawi in which included specific CPAs were implemented. The implementation and operation status of each CPA has been verified as follows:</p> <p>CPA 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.3)<sup>/12/</sup>. 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<sup>/12/</sup>. It has been checked by the verification team that the CPA is below the threshold of 180 GWh/year (thermal)(i.e. 150.17 GWh<sub>th</sub> saving achieved during this monitoring period of 351 days). The distribution model in CPA 001 is that stoves are distributed by local distributors(TLC), 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</p>
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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. A registration number is issued to the ICS user for records. 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.

CPA 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)<sup>12/</sup>. Therefore, the Districts for CPA 002 are same as that of CPA 001 but stoves are separated by their unique serial numbers and fixed locations (household addresses). By the end of current monitoring period total 20,631 ICSs were disseminated under CPA 002, which is within estimated quantity of 20,763 as per Section A.3 of the CPA-DD<sup>12/</sup>. It has been checked by the verification team that the CPA is below the threshold of 180 GWh/year (thermal) (i.e. 136.05 GWh<sub>th</sub> saving achieved during this monitoring period of 351 days). The distribution model in CPA 002 is that stoves are distributed by local distributors(TLC), 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. A registration number is issued to the ICS user for records. 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.

CPA 9558-0003 (also referred to as CPA 003): 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)<sup>12/</sup>. Therefore, the Districts for CPA 003 are same as that of CPA 001 and CPA 002, but stoves are separated by their unique serial numbers and fixed locations (household addresses). By the end of current monitoring period total 18,160 cook stoves were disseminated under CPA 003, which is within estimated quantity of 20,763 ICSs as per Section A.3.of the CPA-DD<sup>12/</sup>. It has been checked by the verification team that the CPA is below the threshold of 180 GWh/year (thermal) (i.e. 52.60 GWh<sub>th</sub> saving achieved during this monitoring period of 225 days). The distribution model in CPA 003 is that stoves are distributed by local distributors (TLC), 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. A registration number is issued to the ICS user for records. 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 all 3 CPAs, stoves were sold throughout

	<p>different villages all of which were located across the 28 districts in Southern, Central and Northern region of Malawi. The database records the stove unique serial number ID and name of household with address. Stove IDs are used for unique identification of the units. The unique stove ID is also recorded on the registration card and then is entered into the electronic database.</p> <p>The type of stoves distributed was confirmed to be TLC Rocket Stove, based on site visit observations in households. This is consistent with the revised approved PoA-DD and CPA-DDs<sup>/12/</sup>.</p> <p>The final MR<sup>/2/</sup> 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.</p>
<b>Findings</b>	CAR-02 has been raised in this context. Refer Appendix 4 of this report
<b>Conclusion</b>	<p>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<sup>/12/</sup>.</p> <p>The CPAs were also found to be completely operational in line with the CPA-DDs<sup>/12/</sup>. The information provided in the relevant sections of the monitoring report is appropriately described the implementation and operational status of the PoA<sup>/18/</sup>.</p>

## 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 CPA9558-0001, 9558-0002 and 9558-0003. The proposed PRC was accepted and approved on 11/08/2015. No corrections were identified during the current monitoring period.

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

>>

The start date of crediting period for specific CPAs has been changed, at the request of CME through the direct communication/notification. These changes are already reflected on UNFCCC project webpage<sup>/18/</sup>.

CPA	Initial start date of crediting period	Revised start date of crediting period
9558-0003	10/12/2014	20/10/2015

### 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 in monitoring plan proposed as part of PRC-9558-001 request in which CPA DDs were revised for CPA9558-0001, 9558-0002 and 9558-0003. The proposed PRC was accepted and approved on 11/08/2015. No permanent changes were identified during the current monitoring period.

**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**

<b>Means of verification</b>	The monitoring plan as contained in all CPA-DDs <sup>/12/</sup> was reviewed against the monitoring requirements of the applied methodology AMS-II.G, version 05 <sup>/19/</sup> as well as PoA-DD <sup>/12/</sup> . 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 <sup>/12/</sup> and applied methodology <sup>/19/</sup> .
<b>Findings</b>	No finding has been raised.
<b>Conclusion</b>	The monitoring plan is in accordance with the approved methodology, AMS-II.G., version 05 <sup>/19/</sup> , that is included in each registered CPA-DD <sup>/12/</sup> .

**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**

<b>Means of verification</b>	<p>The values of <b>B<sub>old</sub></b>, <b>f<sub>NRB,y</sub></b>, <b>η<sub>old</sub></b>, <b>EF<sub>projected_fossilfuel</sub></b>, <b>NCV<sub>biomass</sub></b> and <b>L</b> have been fixed ex-ante during registration of the Project activity. Accordingly, the values were checked and confirmed with the approved revised PoA-DD and respective CPA-DDs<sup>/12/</sup>.</p> <ol style="list-style-type: none"> <li>1. Data/Parameter, Unit: <b>B<sub>old</sub></b>, Tonnes per annum Description: Quantity of woody biomass used in absence of the project activity per device Verified Value: 3.2558. Consistent with the approved revised PoA-DD and respective CPA-DDs<sup>/12/</sup> and fixed ex-ante.</li> <li>2. Data/Parameter, Unit: <b>f<sub>NRB,y</sub></b>, Fraction Description: Fraction of woody biomass saved by the project activity in year y that can be established as non-renewable biomass Verified Value: <table border="1"> <thead> <tr> <th>Region</th><th>f<sub>NRB</sub></th></tr> </thead> <tbody> <tr> <td>Central</td><td>0.97</td></tr> <tr> <td>Northern</td><td>0.93</td></tr> <tr> <td>Southern</td><td>0.90</td></tr> </tbody> </table> Consistent with the approved revised PoA-DD and respective CPA-DDs<sup>/12/</sup> and fixed ex-ante.</li> <li>3. Data/Parameter, Unit: <b>η<sub>old</sub></b>, Fraction Description: Efficiency of 3-stone fire or traditional pot support cooking method (system being replaced) Verified Value: 0.10 Default value in accordance with paragraph 12 of the AMS II.G, version 5<sup>/19/</sup>. Consistent with the approved revised PoA-DD and respective CPA-DDs<sup>/12/</sup> and fixed ex-ante.</li> <li>4. Data/Parameter, Unit: <b>EF<sub>projected_fossilfuel</sub></b>, TCO<sub>2</sub>/TJ Description: Emission factor: substitution of non-renewable woody biomass by similar consumers</li> </ol>	Region	f <sub>NRB</sub>	Central	0.97	Northern	0.93	Southern	0.90
Region	f <sub>NRB</sub>								
Central	0.97								
Northern	0.93								
Southern	0.90								

	<p>Verified Value: 81.6 IPCC 2006 default value in accordance with applied methodology AMS II.G, version 5<sup>/19/</sup>. Consistent with the approved revised PoA-DD and respective CPA-DDs<sup>/12/</sup> and fixed ex-ante</p> <p>5. Data/Parameter, Unit: <b>NCV<sub>biomass</sub></b> , TJ/ tonne Description: Net calorific value of the non-renewable woody biomass that is substituted Verified Value: 0.015 IPCC 2006 default value for wood fuel, wet basis has been applied. Consistent with the approved revised PoA-DD and respective CPA-DDs<sup>/12/</sup> and fixed ex-ante.</p> <p>6. Data/Parameter, Unit: <b>L</b> , Fraction Description: Leakage adjustment factor Verified Value: 0.95 Default value in accordance with paragraph 20 of the AMS II.G, version 5<sup>/19/</sup>. Consistent with the approved revised PoA-DD and respective CPA-DDs<sup>/12/</sup> and fixed ex-ante.</p>
<b>Findings</b>	No finding has been raised.
<b>Conclusion</b>	The values of ex ante fixed parameters have been verified from the approved revised PoA-DD and respective CPA-DDs <sup>/12/</sup> . Same has been crosschecked with the source mentioned in the CPA-DDs and found to be consistent. The verification team confirms that the values used/applied are correct and justified. Also, the ex-ante values have been correctly applied in the calculation of emission reductions.

#### 1.4.2. Data and parameters monitored

<b>Means of verification</b>	<p>The monitoring has been carried out in accordance with the monitoring plan contained in the approved revised PoA-DD and respective CPA-DDs<sup>/12/</sup>. During the verification all relevant monitoring parameter have been verified with regard to the appropriateness of the verification method, the correctness of the values applied for ER calculation, the accuracy, and applied QA/QC measures.</p> <p>1. Data/Parameter, Unit: <b>n<sub>y,j</sub></b>, <b>quantity</b> Description: 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.</p>	
	Measuring /Reading /Recording frequency	The monitoring frequency is annually as mentioned in the CPA-DD (page 23) and PoA-DD (page 31) <sup>/12/</sup> . In accordance with Section B.7.2 of PoA-DD, 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 annual or biennial provided confidence level and precision are appropriately considered. In the current monitoring period 95/10 confidence level and precision has been considered for annual monitoring, which is conservative due to higher confidence level.
	Monitoring equipment	Not applicable



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	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?	<p>The value of parameter is calculated based on the results of the single sampling survey that was conducted by TLC for all 3 implemented CPAs in the current monitoring period. This survey provided the value for the <math>p_y</math> (the percentage of improved cook stoves found to be still in operation based on the sampling survey) as per the ICS type across all CPAs. In all 235 samples were surveyed for ICS model TLC Rocket stove.</p> <p>The sample size calculator required a minimum of 96 samples for ICS model TLC Rocket Stove.</p> <table border="1"> <tr> <td>ICS found operating</td> <td>233</td> </tr> <tr> <td>ICS found non-operating</td> <td>2</td> </tr> <tr> <td><b>Total responded samples</b></td> <td><b>235</b></td> </tr> <tr> <td><b><math>p</math>(operating)</b></td> <td><b>99.15%</b></td> </tr> </table>			ICS found operating	233	ICS found non-operating	2	<b>Total responded samples</b>	<b>235</b>	<b><math>p</math>(operating)</b>	<b>99.15%</b>
ICS found operating	233										
ICS found non-operating	2										
<b>Total responded samples</b>	<b>235</b>										
<b><math>p</math>(operating)</b>	<b>99.15%</b>										

			<p>The number of stoves still in operation is determined as below-</p> <p>CPA 9558-0001: 20,077 x 99.15% = 19,906 units          CPA 9558-0002: 20,631 x 99.15% = 20,456 units          CPA 9558-0003: 18,160 x 99.15% = 18,006 units</p> <p>The calculation for determining the sample size were checked by the verification team and found to be appropriate and consistent with equation in PoA-DD<sup>/12/</sup>. The verified values are included in the final MR<sup>/2/</sup>. The required level of precision i.e. 10% or less has been achieved at 95% confidence level.</p>	
		<p>If applicable, has the reported data been cross-checked with other available data?</p>	<p>Yes. The survey results, assumptions and sales records were checked by the verification team and were found acceptable. The results are reproducible in the corresponding ER spreadsheet<sup>/3/</sup> of final MR<sup>/2/</sup>. The verification team randomly selected 28 samples for DOE's field survey and found that all the ICS were operational, which confirms the CME's sample survey results.</p>	
		<p>Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?</p>	<p>Yes. The QA/QC procedure are in place, internal checks have been done by the CPA implementer and established during the onsite assessment.</p>	
		<p>2. Data/Parameter, Unit: <b>SS<sub>y</sub></b> , <b>Percentage</b>          Description: The percentage of ongoing baseline stove use within the population of in-use ICS during a monitoring period.</p>		
		<p>Measuring /Reading /Recording frequency</p>	<p>The monitoring frequency is annually as mentioned in the CPA-DD and PoA-DD (page 32)<sup>/12/</sup>. In accordance with Section B.7.2 of PoA-DD, 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.</p>	
		<p>Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)</p>	<p>Yes. The PoA-DD allows the monitoring frequency to be annual or biennial provided confidence level and precision are appropriately considered. In the current monitoring period 95/10 confidence level and precision has been considered for</p>	

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			annual monitoring, which is conservative due to higher confidence level.
	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?		<p>The value of parameter is calculated based on the results of the sampling survey that was conducted by TLC for all 3 implemented 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. This survey provided the value for the SS<sub>y</sub> as per the ICS type across all CPAs.</p> <p>The sample size calculator required a minimum of 189 for ICS model TLC Rocket Stove. The calculation for determining the sample size were checked by</p>

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		<p>the verification team and found to be appropriate and consistent with equation in PoA-DD<sup>/12/</sup>. The value of SS<sub>y</sub>, thus determined, is used further in calculation of B<sub>old</sub>, adjusted.</p> <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <tr> <th style="width: 70%;"></th> <th style="width: 30%; text-align: center;">Baseline stove</th> </tr> <tr> <td>Baseline Stove not in use</td> <td style="text-align: center;">162</td> </tr> <tr> <td>Baseline Stove in use</td> <td style="text-align: center;">73</td> </tr> <tr> <td><b>Total Samples Surveyed</b></td> <td style="text-align: center;"><b>235</b></td> </tr> <tr> <td><b>p(baseline stove not in use)</b></td> <td style="text-align: center;"><b>68.94%</b></td> </tr> </table> <p>The verified values are included in the final MR<sup>/2/</sup>. The required level of precision i.e. 10% or less has been achieved at 95% confidence level. The verified results were –</p> <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <tr> <td style="width: 50%;">ICS Model</td> <td style="width: 50%;">SS<sub>y</sub> for all CPAs</td> </tr> <tr> <td>TLC Rocket</td> <td style="text-align: center;">31.06%</td> </tr> </table>		Baseline stove	Baseline Stove not in use	162	Baseline Stove in use	73	<b>Total Samples Surveyed</b>	<b>235</b>	<b>p(baseline stove not in use)</b>	<b>68.94%</b>	ICS Model	SS <sub>y</sub> for all CPAs	TLC Rocket	31.06%
	Baseline stove															
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<b>p(baseline stove not in use)</b>	<b>68.94%</b>															
ICS Model	SS <sub>y</sub> for all CPAs															
TLC Rocket	31.06%															
	<p>If applicable, has the reported data been cross-checked with other available data?</p>	<p>Yes. The survey results<sup>/6/</sup> were checked by the verification team and were found acceptable. The results are reproducible in the corresponding ER spreadsheet<sup>/3/</sup> of final MR<sup>/2/</sup>. The verification team randomly selected 28 samples for DOE's field survey and found that only 4 traditional stoves were found operational along with ICS installed, which confirms the CME's sample survey results. The verification team observed that the sampled household generally do not rely on one cook stove. They use the project ICS as a preference but there are various circumstances (bulk cooking/social events/gathering) that forces them to use an additional cook stove. The survey presented by CME also confirms to the same.</p>														
	<p>Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?</p>	<p>Yes. 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.</p>														

3. Data/Parameter, Unit: t<sub>y,j</sub> , Fraction

	Description: Fraction of monitoring period the stove is in operation (days in operation/total days in monitoring period)	
	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) <sup>12/</sup> .
	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?	<p>The parameter is calculated based on the formula:  <math>t_{y,j} = (\text{Date of end of monitoring period} - \text{Date of stove registration}) / \text{Length of monitoring period}</math>  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</p>	

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		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 sold/distributed for each CPA. The verified results are included in the final MR <sup>12/</sup> and corresponding ER spreadsheet <sup>3/</sup> . The verified results were: Average CPA 1: 1.00 Average CPA 2: 0.87 Average CPA 3: 0.60					
	If applicable, has the reported data been cross-checked with other available data?	Yes. All the input values used to calculate this parameter were cross-checked by verification team e.g., Registration database for ICS <sup>5/</sup> (for dates), relevant dates of crediting and monitoring period as presented in ER spreadsheet <sup>3/</sup> .					
	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes. Once the ICS is sold/distributed to the beneficiary it is registered into respective CPA database based on purchase receipts (hard copies/SMS). The spot checks were regularly conducted by TLC (seller/distributor) in order to correct the CPA database, as appropriate. During the site visit the sale process, record keeping (registration dates) and process of spot check were reviewed and were found reliable.					
	<p>4. Data/Parameter, Unit: <math>\eta_{new,y,i}</math>, <b>Fraction</b> Description: Continuing efficiency of ICS</p> <table border="1"> <tr> <td>Measuring /Reading /Recording frequency</td><td>Calculated once in a year using Water Boiling Test<sup>23/</sup>.</td></tr> <tr> <td>Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)</td><td>Yes. As per PoA-DD (page 32)<sup>12/</sup>.</td></tr> <tr> <td>Monitoring equipment</td><td>The WBT tests were coordinated by the CME and undertaken following a simplified version of WBT protocol 4.2.2<sup>23/</sup> by an experienced party. The PoA-DD or CPA-DDs do not prescribe any specific monitoring equipment but weighing scale and digital thermometer were required and used to conduct WBT. The detail is provided under Section I.5 of this report.</td></tr> </table>		Measuring /Reading /Recording frequency	Calculated once in a year using Water Boiling Test <sup>23/</sup> .	Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes. As per PoA-DD (page 32) <sup>12/</sup> .	Monitoring equipment
Measuring /Reading /Recording frequency	Calculated once in a year using Water Boiling Test <sup>23/</sup> .						
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes. As per PoA-DD (page 32) <sup>12/</sup> .						
Monitoring equipment	The WBT tests were coordinated by the CME and undertaken following a simplified version of WBT protocol 4.2.2 <sup>23/</sup> by an experienced party. The PoA-DD or CPA-DDs do not prescribe any specific monitoring equipment but weighing scale and digital 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?	<p>The reported values were checked with the actual WBT results<sup>4/</sup> and CME filled in Sheets (for this purpose) and were found consistent. The WBT results were conducted for ICS based on Model and Vintage using sampling survey. The sample survey approach is included under Section I.4.3 of this report.</p> <p>The efficiency of the TLC Rocket stove in CPA-</p>

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		<p>DD and PoA-DD<sup>/12/</sup> was assumed based on efficiency value of ICS from the WBT test conducted by ICS promoter TLC on request from CQC (CME). However, during the actual WBT test carried out by third party the actual efficiency of ICS varied from 26.10% to 31.70% for vintage 1 ICS, 27.0% to 32.33% for vintage 2 and from 25.33% to 30.0% for vintage 3 ICS. The average value of all WBT result has been considered for calculation as per the methodology. The efficiency of ICS installed varies based on the various factors like quality of local wood used, weather conditions etc. ; as the WBT were conducted at the ICS user premises and not under standard conditions.</p> <p>The verified values are summarized below;</p> <table border="1" style="margin-left: auto; margin-right: auto; border-collapse: collapse;"> <thead> <tr> <th></th> <th colspan="3"><math>\eta_{new,i}</math></th> </tr> <tr> <th></th> <th>Vintage 1</th> <th>Vintage 2</th> <th>Vintage 3</th> </tr> </thead> <tbody> <tr> <td>TLC Rocket Stove</td> <td>29.24%</td> <td>28.96%</td> <td>27.87%</td> </tr> </tbody> </table>		$\eta_{new,i}$				Vintage 1	Vintage 2	Vintage 3	TLC Rocket Stove	29.24%	28.96%	27.87%	
	$\eta_{new,i}$														
	Vintage 1	Vintage 2	Vintage 3												
TLC Rocket Stove	29.24%	28.96%	27.87%												
	<p>If applicable, has the reported data been cross-checked with other available data?</p>	<p>Yes. The data has been cross-checked with the estimated efficiency (25.66%) in the registered CPA-DDs<sup>/12/</sup>. The actual efficiencies in this monitoring period were slightly higher, which is based on actual WBT tests conducted at ICS user premises and hence acceptable.</p>													
	<p>Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?</p>	<p>Yes. 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 is in place. WBT Protocol Version 4.2.2<sup>/23/</sup> was applied, which is acceptable.</p>													
<b>Findings</b>	CAR -03has been raised in this context. Refer Appendix 4 of this report.														
<b>Conclusion</b>	Corresponding to the §389 of CDM VVS V9 <sup>/16/</sup> , the verification team confirm that the monitoring has been carried out in accordance with the approved revised PoA-DD and CPA-DDs <sup>/12/</sup> . The monitoring system is in compliance with the information flow for the parameters as mentioned in monitoring plan in approved revised PoA-DD and CPA-DDs <sup>/12/</sup> . The monitored data for the parameters has been verified by checking the procedure for information flow and found to be complete and consistent with approved revised CPA-DDs <sup>/12/</sup> .														

### I.4.3. Implementation of sampling plan

<b>Means of verification</b>	<p>The monitoring has been carried out in accordance with the monitoring plan contained in the PoA-DD and respective CPA-DDs<sup>/12/</sup>.</p> <p><b>Sampling Design/Target Population/Sampling Frame/Reliability:</b>  A simple random sampling method has been used, which is in line with the monitoring plan of the PoA-DD (Section B.7.2) as referred in the respective CPA-DDs<sup>/12/</sup>. In this sampling design all 3 CPAs that are implemented under the current monitoring period were subjected. The sampling frame considered confidence level and precision as 95/10for annual sampling survey in order to meet the requirement of Standard<sup>/24/</sup>. As there is only one CPA implementer, it was considered as Primary Sample Unit. The target population was the households located in 3</p>
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Districts located in Eastern Province of Malawi. Each household had the equal chance of selection.

#### Sampling Method:

There was one primary sampling unit as discussed above. Thereafter, ICS/households present in each district were randomly selected as per the outcome of sampling size calculation for respective parameter.

#### 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

$SS_y$ : Percentage of continued baseline stove use among ICS households in the database

$\eta_{new,i}$ : Thermal Efficiency of operational ICS

The sample sizes were determined for single type of ICS (TLC Rocket Stove), for  $n_{y,j}$  and  $SS_y$  both being proportional value. The outcome of sample size calculation (required and actual samples) based on the considered confidence level and precision is presented below:

Type of Stoves	Sample Size for $n_{y,j}$	Sample Size for $SS_y$	Actual Sampling Done
TLC Rocket Stove	96	189	235

In this regard, sample size calculation spreadsheet<sup>/4/</sup> was checked and found correct as per registered monitoring plan.

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. The number in the brackets represents the actual surveyed ICS for that type and vintage:

Type of Stoves	$\eta_{new,i}$ (actual sampling in bracket)		
	Vintage 1	Vintage 2	Vintage 3
TLC Rocket Stove	12(12)	8 (8)	13(13)

As can be seen that the sampling requirements were met for TLC Rocket Stove for vintage (1,2 and 3). The actual surveyed ICS were equal to the required number, as mentioned above. As these were based on sampling approach, the reliability of precision was checked and found within the prescribed limit (<10%).

#### Sample selection:

Considering the simple random sampling the CME targeted all regions of Malawi (keeping operational considerations) for each of the parameter of interest with a varying number of ICS to be visited. This was found in accordance with Guideline: Sampling and surveys for CDM project activities and programmes of activities<sup>/25/</sup>. Keeping that in mind a minimum number of ICS was known to CME for each parameter of interest. Thereafter, the ICS were randomly selected. The randomization was undertaken in excel, and the same has been verified by the verification team. The samples were drawn from the complete sales databases. In order to confirm whether the sample is representative of the different model of ICS, the verification team has checked the proportion of total sales with different model stoves versus the proportion of selected households with different stoves. The same is found to be justified and appropriate. Hence the verification team able to

confirm that the samples are representative of the total population.

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.

#### Reliability and precision calculation:

The verification team has verified the sampling CER calculation spreadsheets<sup>/3/</sup> with the monitored data, where the actual achieved precision is calculated against the guidelines outlined under “Standard for sampling and surveys for CDM project activities and programme of activities “(version 05)<sup>/24/</sup> and can confirm that the calculation of achieved reliability was done correctly. The verification team confirmed from the sample size calculation spreadsheet<sup>/4/</sup> that the required precision was kept 10% during sample size calculation for each type of stove for each vintage.

The results for calculations are reproduced, as an example, in the table for parameter  $n_{y,j}$  for TLC Rocket Stove as follows –

Table – Sample size calculation prior to survey

Parameter	Value	Source/ basis
Population Size	58,868	Project database (Number of stoves registered in database till 31/05/2016)
Expected Proportion considered	0.8	Assumed value by CME for sample size calculation.
Confidence Level	1.96	95% confidence level
Precision level	0.10	10% relative precision
Sample Size	96	Calculated

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

Parameter	Value	Source/ basis
N	235	Actual sample size surveyed by CME
Overall Proportion	99.15%	Actual value
Confidence Level	1.96	95% confidence level
Precision achieved	1.18%	Calculated
Is required precision achieved?	Yes	< 10%

In the same manner, all parameters of interest are included in the Sample Size Calculations spreadsheet<sup>/4/</sup>. 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 spreadsheet<sup>/3/</sup> corresponding to final Monitoring Report<sup>/2/</sup>, 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<sup>/6/</sup> were directly used in the calculation of ERs.

<b>Findings</b>	No finding has been raised.
<b>Conclusion</b>	The sample size selected confirms the desired 95% level of confidence and with a 10% margin of error. Hence, the sampling survey carried out by CPA implementers is in accordance with applied methodology AMS-II.G., Version

**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 <sup>/12/</sup> ) does not state the calibration requirements for any of the parameter (Section I.4.2) <sup>/12/</sup> . 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 – Valor 1000 V11P6-AM	Range: upto 6 kg (±1g) Calibration facility: within the instrument with known weights Calibration frequency: Once in 3 Years as per EB 61, Annex 21, paragraph 17 (c): Date of purchase: 21/09/2015 <sup>/8/</sup> Due date of Next Calibration: 20/09/2018
	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 <sup>/9/</sup> Date of purchase: 21/09/2015 <sup>/9/</sup> Due date of Next Calibration: 20/09/2016
	<p>For electronic weighing scale, manufacturer<sup>/8/</sup>recommended for span calibration by user based on the procedure specified in the manual before first use. Based on the instruction provided in the user manual, CME has done span calibration of the weighing scale before the first use on 24/05/2016<sup>/8/</sup>. The calibration frequency of Weighing Scale was not defined in product manual and it is up to user to calibrate it as and when the need arise. However, referring to “General Guidelines to SSC CDM methodologies”, EB 61, Annex 21 (paragraph 17c) , CME has decided to calibrate the weighing scale at least once in 3 years , which is before 21/09/2018 (3 years from date of purchase i.e. 21/09/2015. Therefore, it can be stated that it was in worthy state of use.</p> <p>For digital thermometer, manufacturer recommended<sup>/9/</sup> that, the thermometer should be calibrated annually starting one year after purchase<sup>/9/</sup> (Referred page 13 of user manual provided by Manufacturer). Therefore, it is confirmed that equipment was calibrated by manufacturer before dispatch and would require further calibration after 1 year from first use. The digital thermometer was used prior to 21/09/2016 (i.e. within one year from the date of purchase) as per the survey dates (June 2016)and therefore it can be stated that these were in worthy state of use.</p> <p>CME has clearly indicated in MR<sup>/2/</sup> that the calibration will be conducted on specified frequency in future or a new set of equipment will be purchased at the time of next WBT test. The specifications of equipment establish that the results are reliable. Therefore, appropriate QA/QC procedures have been followed for the monitoring parameters under discussion.</p>		
Findings	CAR-04has been raised in this context. Refer Appendix 4 of this report.		
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 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	<p>The following equations were used to determine the baseline emissions as provided in the monitoring report <sup>/2/</sup> and applied in the corresponding ER sheet <sup>/3/</sup>. The expressions used were found consistent with the revised PoA-DD and CPA-DDs<sup>/12/</sup> and the applied methodology AMS-II.G, version 05<sup>/19/</sup>:</p> <p><b>ER<sub>y</sub> = B<sub>y,savings</sub> • f<sub>NRBy</sub> • NCV<sub>biomass</sub> • EF<sub>projected_fossilfuel</sub> • L</b></p> <p>Total biomass that is saved in tonnes during the monitoring year (y) <b>B<sub>y, savings</sub></b>, is calculated using the equation below:</p> $B_{y,savings} = B_{old} \cdot \left( 1 - \frac{\eta_{old}}{\eta_{new}} \right)$ <p>To determine the number of stoves under operation for fractions of the monitoring period, the following formula is used:</p> $N_{y,i} = \sum_{j=1}^{J_y} n_{y,j} \cdot t_{y,j}$ <p>Therefore, <b>B<sub>y,savings</sub></b> for each vintage is calculated using the following expression:</p> $B_{y,savings} = B_{old,adjusted} \cdot \left[ \sum_{i=1}^n N_{y,i} \left( 1 - \frac{\eta_{old}}{\eta_{new,i}} \right) \right]$ <p>The percentage of households continuing to use a baseline stove in addition to an ICS has been monitored in order to address paragraph 20(b) of the methodology AMS-II.G (version 3). The monitored (ex-post) percentage of ICS users continuing to use a baseline stove in addition to the ICS (parameter SS<sub>y</sub>) will be compared to the ex-ante percentage found in the baseline survey (19.7%) and B<sub>old</sub> will be adjusted proportionally based on the proportional change in the percentage. This adjustment is reflected in B<sub>old, adjusted</sub>. Further the value of <b>B<sub>old,adjusted</sub></b> is calculated for each CPAs for separately as under:</p> $B_{old,adjusted} = B_{old} \times \left[ \frac{1.0471}{1 + (SS_y / 0.197) \times (1.0471 - 1)} \right]$ <p>It is confirmed that all the stoves sold/distributed under each CPA has been categorized as per vintage. This is summarized in the table below;</p> <table><tr><td>Vintage</td><td>Cut-off date</td><td>Remarks</td></tr><tr><td> </td><td> </td><td> </td></tr></table>	Vintage	Cut-off date	Remarks			
Vintage	Cut-off date	Remarks					

	(Type)	(InstallationDate of ICS)	
	Vintage 1	Between 31/05/2016 to 31/05/2015	Up to 1 years old registered ICS
	Vintage 2	Between 31/05/2015 to 31/05/2014	Up to 2 years old registered ICS
	Vintage 3	On or before 31/05/2014	Up to 3 years old registered ICS
<p>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<sup>/3/</sup> to the final Monitoring Report<sup>/2/</sup> has considered the number of stoves as per the vintage and accordingly the efficiency of such stoves in the ER calculation for each CPA.</p>			
<b>Findings</b>	CAR-05has been raised in this context. Refer Appendix 4 of this report.		
<b>Conclusion</b>	<p>The verification team confirms that –</p> <ul style="list-style-type: none"> <li>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<sup>/3/</sup> of final Monitoring Report<sup>/2/</sup>;</li> <li>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);</li> <li>c) Appropriate methods and formulae for calculating baseline GHG emissions or baseline net GHG removals were followed;</li> <li>d) All assumptions used in the emission calculations were found appropriate and therefore justified;</li> <li>e) Appropriate emission factors, IPCC default factors and other reference values were correctly applied. This has also been elaborated under Section I.4.1 of this report;</li> <li>f) There is no pro-rate approach (§403(e) of CDM VVS Version 09<sup>/16/</sup>) 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.</li> </ul>		

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

<b>Means of verification</b>	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.
<b>Findings</b>	No finding has been raised.
<b>Conclusion</b>	No additional project emissions calculation were required in accordance with the methodology AMS-II.G, version 05 <sup>/19/</sup> .

#### I.6.3. Calculation of leakage GHG emissions

<b>Means of verification</b>	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.
<b>Findings</b>	No finding has been raised.
<b>Conclusion</b>	No additional leakage emissions (other than what is already considered in baseline calculations) calculation were required in accordance with the methodology AMS-II.G, version 05 <sup>/19/</sup> .

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

<b>Means of verification</b>	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
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	<p>report<sup>2/</sup> and corresponding ER sheet <sup>103/</sup> were found appropriate and complying with the provisions prescribed in the registered monitoring plan of respective CPA-DDs, PoA-DD and applied methodology.</p> <p>The verification team confirms that an audit trail that contains the evidence and records that validated the stated figures were checked and found acceptable.</p> <p>Verification team checked the ER calculation sheet considering calculation of emission reductions for each stove separately using corresponding <math>f_{NRB}</math> values (based on different regions) and using ICS efficiency for each vintage separately. The final value of ER achieved is coming out to be 99,940 tCO<sub>2</sub>e .Therefore, verification team accepted the ER calculation based on individual ICS approach which is in line with the registered PoA-DD and CPA-DDs. Verification team also confirms that there are no deviations in using the formulas and equations in accordance with registered monitoring plan. The only deviation in calculation of emission reduction considered is that to account for the losses of emission reductions (ERs) due to non-operational of ICS, the total of emission reductions achieved by each CPA will take into account the proportion of ICS in operation which 99.15%.</p>
<b>Findings</b>	CL-02has been raised in this context. Refer Appendix 4 of this report.
<b>Conclusion</b>	<p>The verification team confirms that :</p> <ul style="list-style-type: none"> <li>a) The complete data was available and is duly reported;</li> <li>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);</li> <li>c) Appropriate methods and formulae for calculating baseline GHG emissions or baseline net GHG removals, project emissions and leakage emissions were followed;</li> <li>d) Appropriate emission factors, IPCC default factors and other reference values were correctly applied;</li> <li>e) There is no pro-rate approach ( §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.</li> <li>f) The total number of ERs achieved during the current monitoring period is 99,940 tCO<sub>2</sub>e.</li> </ul>

Specific-case CPA reference number	Baseline emissions or baseline net GHG removals by sinks (tCO <sub>2</sub> e)	Project emissions or actual net GHG removals by sinks (tCO <sub>2</sub> e)	Leakage (tCO <sub>2</sub> e)	GHG emission reductions or net GHG removals by sinks (tCO <sub>2</sub> e)		
				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	44,471	0	0	0	44,471	44,471
9558-0002	40,035	0	0	0	40,035	40,035
9558-0003	15,434	0	0	0	15,434	15,434
<b>Total</b>	<b>99,940</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>99,940</b>	<b>99,940</b>

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

<b>Means of verification</b>	<p>As verified and evident from the final Monitoring Report <sup>/2/</sup> and corresponding ER sheet<sup>/03/</sup>, 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 except for the CPA 9558-0001. This is due to lower number of ICS sold/distributed due to operational difficulties.</p> <p>However, due to achieving higher thermal efficiency compared to the ex ante assumed value in CPA-DDs, the actual emission reduction achieved for CPA 9558-0001 is 3.10% higher compared to ex ante estimates of CPA-DD. In revised approved CPA-DD the efficiency of ICS assumed as 25.66%, however in actual during 2<sup>nd</sup> monitoring survey the thermal efficiency of ICS comes out to be 28.44%(weighted average value) for CPA 9558-0001. Verification team checked the WBT test reports for all vintages and found them in line with the WBT protocol.</p>
<b>Findings</b>	CL-01has been raised in this context. Refer Appendix 4 of this report.
<b>Conclusion</b>	The actual emission reductions achieved in each specific CPA DD are not higher than the estimated quantity of ERs in the respective CPA-DDs except for CPA 9558-0001, which is properly justified in MR <sup>/2/</sup> . Therefore, 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
<b>CPA 9558-0001</b>	43,132tCO <sub>2</sub> e	44,471 tCO <sub>2</sub> e
<b>CPA 9558-0002</b>	43,132tCO <sub>2</sub> e	40,035 tCO <sub>2</sub> e
<b>CPA 9558-0003</b>	27,649 tCO <sub>2</sub> e	15,434 tCO <sub>2</sub> e
<b>Total</b>	<b>113,913 tCO<sub>2</sub>e</b>	<b>99,940 tCO<sub>2</sub>e</b>

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

<b>Means of verification</b>	The actual emission reductions were less than the estimation in the CPA-DDs for an equivalent length of the monitoring period, except for CPA 9558-0001. An explanation has been added in the MR as well as section I.6.5 of this report in this regard.
<b>Findings</b>	No CL-01has been raised in this context. Refer Appendix 4 of this report.
<b>Conclusion</b>	The actual ERs are less than the estimated quantity of ERs as given in the respective CPA-DDs, except for CPA 9558-0001.This is properly addressed in MR <sup>/2/</sup> is appropriate and accepted.

## Appendix 1. Abbreviations

Abbreviations	Full texts
AQL	Acceptable Quality Level
BE	Baseline Emissions
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CDM EB	CDM Executive Board
CERs	Certified Emission Reductions
CL	Clarification Request
CME	Coordinating or Managing Entity
CMP	Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol
CO <sub>2</sub> e	Carbon dioxide equivalent
COP	Conference of Parties
CPA	Component Project Activity
CQC	C-Quest Capital Malaysia Global Stoves Limited
DD	Design Document
DNA	Designated National Authority
DOE	Designated Operational Entity
EF	Emission Factor
ERs	Emission Reductions
ESPL	Earthood Services Private Limited
FAR	Forward Action Request
GHGs	Greenhouse Gas(es)
GPRS	General Packet Radio Service
GPS	Global Positioning System
GWh <sub>th</sub>	Giga Watt Hour (Thermal, in this document)
ICS	Improved Cook Stove(s)
ISO	International Organization of Standardization
IPCC	Intergovernmental Panel on Climate Change
KP	Kyoto Protocol
LE	Leakage Emissions
MR	Monitoring Report
MP	Monitoring Period
NA	Not Applicable
PE	Project Emissions
PoA	Programme of Activities
PRC	Post-registration change(s)
PS	Project Standard
PCP	Project Cycle Procedure
QA/QC	Quality Assurance/Quality Control
SMS	Short Message Service (Tex Messages)
TLC	Total Land Care
UNFCCC	United Nations Framework Convention on Climate Change
UQL	Unacceptable Quality Level
VVS	Validation & Verification Standard
WBT	Water Boiling Test



## Appendix 2. Competence of team members and technical reviewers

Competence Statement			
<b>Name</b>	Akhilesh Joshi		
<b>Country</b>	India		
<b>Education</b>	B. Tech. (Chemical Engineering), MNIT Jaipur MBA (Oil & Gas), UPES Dehradun		
<b>Experience</b>	13 Years		
<b>Field</b>	Cement, Energy Efficiency, Climate Change		
Approved Roles			
<b>Team Leader</b>	YES		
<b>Validator</b>	YES		
<b>Verifier</b>	YES		
<b>Financial Expert</b>	NO		
<b>Technical Reviewer</b>	NO		
<b>TA Expert (1.2, 3.1, 4.1)</b>	YES		
<b>Reviewed by</b>	Abhishek Mahawar	<b>Date</b>	08/02/2016
<b>Approved by</b>	Ashok Kumar Gautam	<b>Date</b>	08/02/2016

Competence Statement			
<b>Name</b>	Nayan Jyoti Deka		
<b>Country</b>	India		
<b>Education</b>	M.Tech. (Energy Technology), Tezpur University		
<b>Experience</b>	8 Years		
<b>Field</b>	Climate Change & Energy Management		
Approved Roles			
<b>Team Leader</b>	YES		
<b>Validator</b>	YES		
<b>Verifier</b>	YES		
<b>Financial Expert</b>	NO		
<b>Technical Reviewer</b>	YES		
<b>TA Expert (1.1, 1.2, 3.1, 13.1)</b>	YES		
<b>Reviewed by</b>	Abhishek Mahawar	<b>Date</b>	12/10/2015
<b>Approved by</b>	Ashok Kumar Gautam	<b>Date</b>	12/10/2015

Competence Statement	
<b>Name</b>	Enea Katundu
<b>Country</b>	Malawi
<b>Education</b>	Master of Science
<b>Experience</b>	8 Yrs
<b>Field</b>	Research and Social Empowerment
Approved Roles	

Team Leader	NO		
Validator	NO		
Verifier	NO		
Financial Expert	NO		
Technical Reviewer	NO		
TA Expert	NO		
Local Expert	YES (Malawi)		
Reviewed by	Abhishek Mahawar	Date	18/07/2016
Approved by	Ashok Kumar Gautam	Date	18/07/2016

### Appendix 3. Documents reviewed or referenced

No.	Author	Title	References to the document	Provider
1	CQC	Monitoring Report (made publicly available) Monitoring Report (Intermediate version)	Version 01 dated 10/06/2016 Version 02 dated 08/08/2016	CME
2	CQC	Monitoring Report (final version)	Version 03 dated 19/10/2016	CME
3	CQC	<ul style="list-style-type: none"> <li>ER spread sheet corresponding to MR</li> <li>ER spread sheet corresponding to MR (final version)</li> </ul>	Version 01 Version 02	CME
4	CQC	Sample Calculation Malawi (for Sample size and precision calculation spreadsheet – prior to survey and after the survey) Sampling Survey including WBT test results	-	CME
5	CQC	ICS registration database till end date of 2 <sup>nd</sup> MP (i.e. 31/05/2016)	-	CME
6	CQC	Reports of sampling survey conducted including WBT Tests	-	CME
7	CQC	Technical Specification of all types of ICS distributed from Manufacturer / supplier (including photos of some installed ICSs)	-	CME
8	CQC	Purchase receipts and User Manual of the weighing scale used for WBT tests Declaration of self calibration of weighing scale by CME	Dated 21/09/2015 Dated 24/05/2016	CME
9	CQC	Purchase receipts and User Manual of the thermometer used for WBT tests	Dated 21/09/2015	CME
10	CQC	Sample copies of filled survey questionnaire	-	CME
11	ESPL	DOE Field Survey of Registered ICS Users	-	Others
12	CQC	Latest revised approved PoA-DD and CPA-DDs for “Improved Cookstoves Program for Malawi and cross-border regions of	<a href="#">Web link</a>	Others

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		<p>Mozambique” UNFCCC PoA9558 - PoA –DD version 11 dated 27/04/2015</p> <p>CPA-DD 9558-0001 version 11 dated 10/05/2015</p> <p>CPA-DD 9558-0002 version 05 dated 10/05/2015</p> <p>CPA-DD 9558-0003 version 05 dated 10/05/2015</p>		
13	<p>TUV SUD</p> <p>ESPL</p>	<ul style="list-style-type: none"> <li>• PoA Validation report (Version 06 dated 10/03/2014), CPA 9558-0001 Validation report and CPA 9558-0002 Validation report for “Improved Cookstoves Program for Malawi and cross-border regions of Mozambique” UNFCCC PoA9558</li> <li>• PRC Validation Opinion (Version 02 dated 10/06/2015) for “Improved Cookstoves Program for Malawi and cross-border regions of Mozambique” UNFCCCPoA9558</li> </ul>	<p><a href="#">Web link</a></p> <p><a href="#">Web link</a></p>	Others
14	ESPL	1 <sup>st</sup> MP Verification Report (version 01 dated 30/09/2014) for “Improved Cookstoves Program for Malawi and cross-border regions of Mozambique” UNFCCCPoA9558	<a href="#">Web link</a>	Others
15	TUV SUD	CPA 9558-0003inclusionvalidation report for “Improved Cookstoves Program for Malawi and cross-border regions of Mozambique ” UNFCCC PoA9558	<a href="#">Web link</a>	Others
16	CDM EB	<p>a) UNFCCC CDM Validation and Verification Standard</p> <p>b) CDM Project Standard</p> <p>c) CDM Project Cycle Procedure</p>	Version 09	Others
17	CDM EB	E-mail from CDM Secretariat confirming the monitoring report /P01/ made publically available from 16/06/2016	Email dated 16/06/2016 from UNFCCC secretariat	Others
18	CDM EB	UNFCCC project page of PoA reference number (9558)	<a href="#">Web link</a>	Others
19	CDM EB	Approved CDM consolidated baseline and monitoring methodology AMS-II.G. “Energy efficiency measures in thermal applications of non-renewable biomass” (Version 05)	<a href="#">Web link</a>	Others
20	-	<p>Websites referred:</p> <p>a. <a href="http://cdm.unfccc.int/index.html">http://cdm.unfccc.int/index.html</a></p> <p>b. <a href="http://www.itouchmap.com/latlong.html">http://www.itouchmap.com/latlong.html</a></p> <p>c. <a href="http://www.ipcc-nggip.iges.or.jp/">http://www.ipcc-nggip.iges.or.jp/</a></p>	-	Others
21	ESPL	Verification Protocol	-	Others
22	CDM EB	Monitoring Report Form Monitoring report form for CDM programme of activities along with Instruction for filling out monitoring report form	Version 01	Others
23	Global	The Water Boiling Test Protocol	Version 4.2.2	Others

	Alliance for Clean Cookstoves			
24	CDM EB	Standard: Sampling and surveys for CDM project activities and programme of activities	Version 05	Others
25	CDM EB	Guideline: Sampling and surveys for CDM project activities and programme of activities	Version 04	Others
26	CQC	ER calculation sheet considering calculation of emission reductions for each stove separately using corresponding $f_{NRB}$ values (based on different regions) and using ICS efficiency for each vintage separately	Dated 19/10/2016	CME

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

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

There is no finding from validation or previous verification report.

**Table 2. CL from this verification**

CL ID	01	Section no.	1.6.5.	Date : 05/08/2016
<b>Description of CL</b>				
CME to clarify the reason for achieving higher then ex ante ERs for CPA 9558-0001 during the current monitoring period.				
<b>Project participant response</b>				<b>Date : 08/08/2016</b>
Actual emission reductions for CPA 9558-0001 are more than the estimated emission reduction in registered CPA-DD. The reason for increase in the actual emission reduction is the higher value of the thermal efficiencies ( $\eta_{new,y,i}$ ) for different vintages. The ex-ante efficiency of the TLC Rocket stove was assumed based on minimum guaranteed value of ICS from the manufacturer while the ex-post efficiency is the average efficiency calculated by the water boiling tests during monitoring surveys.				
<b>Documentation provided by project participant</b>				
WBT Test Reports for 2 <sup>nd</sup> Monitoring Survey				
<b>DOE assessment</b>				<b>Date:09/08/2016</b>
CME as a response, have clarified that reason for achieving higher then ex ante ERs for CPA 9558-0001 is due to higher value of thermal efficiency considered compared to ex ante estimated in CPA-DD for ICS during the monitoring period. In CPA-DDs the efficiency of ICS assumed as 25.66%, however in actual during 2 <sup>nd</sup> monitoring survey the thermal efficiency of ICS comes out to be 28.44%(weighted average value for CPA 9558-0001). Verification team checked the WBT test reports for all vintages and found them in line with the WBT protocol. Same is now updated in the MR and found acceptable. Therefore, this CL is closed.				

CL ID	02	Section no.	1.6.4	Date : 11/10/2016
<b>Description of CL</b>				
In the ER calculation sheet, the weighted average of $f_{NRB}$ values (based on different regions) and the weighted average of ICS efficiency values (based on different vintages) are used. Also, the average value of fraction of monitoring period ( $t_{y,i}$ ) is multiplied. CME to clarify the reason for not calculating emission reductions for each stove separately by multiplying corresponding values for $f_{NRB}$ , ICS efficiency and fraction of monitoring period in line with registered Monitoring Plan.				
<b>Project participant response</b>				<b>Date : 19/10/2016</b>

CQC has calculated the CERs considering individual stove and calculating ERs based on corresponding $f_{NRB}$ values, efficiencies and time fraction. Total emission reduction calculated by this process comes to be higher than the emission reduction calculated by adopting the weighted average approach.	
<b>Documentation provided by project participant</b>	
ER calculation sheet considering individual stove approach	
<b>DOE assessment</b>	<b>Date:</b> 20/10/2016
CME as a response, have provided the ER calculation sheet considering calculation of emission reductions for each stove separately using corresponding $f_{NRB}$ values (based on different regions) and using ICS efficiency for each vintage separately. The final value of ER achieved is coming out to be 99,940 tCO <sub>2e</sub> which is on higher side compared to the ER achieved based on using weighted average value of $f_{NRB}$ , ICS efficiency and fraction of monitoring period ( $t_{y,i}$ ) which is 99,534 tCO <sub>2e</sub> . Although there is no mention of using weighted average values of monitoring parameters in registered monitoring plan, CME used this approach to simplify the calculation of ERs as every year, the calculation of ER for individual stove will become more complex, as can be seen in the provided ER calculation sheet considering individual stove approach. However, verification team accepted the ER calculation based on individual ICS approach as it is in line with the registered PoA-DD and CPA-DDs, as well as applied methodology. Therefore, this CL is closed.	

Table 3. CAR from this verification

<b>CAR ID</b>	01	<b>Section no.</b>	G.2.	<b>Date :</b> 05/08/2016
<b>Description of CAR</b>				
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.				
<b>Project participant response</b>				<b>Date :</b> 08/08/2016
The serial numbers of ICS mentioned in column G of worksheet "ER sheet CPA 1" and "ER sheet CPA 2" have now been corrected by issuing new labels on site. The verification team has verified the same at the time of on site audit.				
<b>Documentation provided by project participant</b>				
Individual CPA Database till 31/05/2016				
<b>DOE assessment</b>				<b>Date:</b> 09/08/2016
Verification team found 665 ICS under CPA 9558-0001 and 1828 ICS under CPA 9558-0002, where serial number of ICS have been corrected by issuing new labels. Verification team found all new labels as unique and there is no duplication found in the database during the verification. Therefore, this CAR is closed.				

<b>CAR ID</b>	02	<b>Section no.</b>	I.1.	<b>Date :</b> 05/08/2016
<b>Description of CAR</b>				
Total number of ICS distributed under CPA 9558-0001 as mentioned under section D.1 of MR is inconsistent with the corresponding ER spreadsheet provided.				
<b>Project participant response</b>				<b>Date :</b> 08/08/2016
Total number of ICS distributed under CPA 9558-0001 has now been made consistent in the revised MR with the corresponding ER spreadsheet provided.				
<b>Documentation provided by project participant</b>				
Revised MR version 2				
<b>DOE assessment</b>				<b>Date:</b> 09/08/2016
CME as a response, have corrected the total number of ICS distributed under CPA 9558-0001 to 20,077 in revised MR, which is consistent with CPA Database and ER spreadsheet provided. Therefore, this CAR is closed.				

<b>CAR ID</b>	03	<b>Section no.</b>	I.4.2	<b>Date :</b> 05/08/2016
<b>Description of CAR</b>				
The following values of monitored parameters are inconsistent between MR and corresponding ER spreadsheet –				
a) Parameter $N_{y,j}$ for CPA 9558-0001				
b) Parameter $\eta_{new,y,i}$ for vintage 1, vintage 2 and vintage 3				
<b>Project participant response</b>				<b>Date :</b> 08/08/2016
The values of monitored parameters $N_{y,j}$ and $\eta_{new,y,i}$ are now made consistent in the revised MR with the corresponding ER spreadsheet.				
<b>Documentation provided by project participant</b>				
Revised MR version 2				

<b>DOE assessment</b>	<b>Date:</b> 09/08/2016
CME as a response, have corrected the values of parameter $N_{y,j}$ and parameter $N_{y,j}$ in the revised MR in line with the ER spreadsheet. Verification team checked the project database and sampling survey sheet to confirm the values mentioned in ER spreadsheet as correct. Therefore, this CAR is closed.	

<b>CAR ID</b>	04	<b>Section no.</b>	I.5.	<b>Date :</b> 05/08/2016
<b>Description of CAR</b>				
Under section G.2 of MR, the type, specification and details of calibration of the monitoring equipments used for determination of value of parameter $\eta_{new,y,l}$ has not been provided.				
<b>Project participant response</b>				<b>Date :</b> 08/08/2016
Under section G.2 of MR, the type, serial number, specification and details of calibration of the monitoring equipment used for determination of value of parameter $\eta_{new,y,l}$ have now been mentioned in the revised MR.				
<b>Documentation provided by project participant</b>				
Revised MR version 2				
<b>DOE assessment</b>				<b>Date:</b> 09/08/2016
CME as a response, have now provided details of the equipments used for conducting WBT test for deriving the parameter $\eta_{new,y,l}$ under section G.2. of MR. Verification team physically checked the thermometers and weighing scale used on site and confirms the same. The equipments are purchased recently and there calibration is not due during the present monitoring period. Therefore, this CAR is closed.				

<b>CAR ID</b>	05	<b>Section no.</b>	I.6.1	<b>Date :</b> 05/08/2016
<b>Description of CAR</b>				
a) Calculation of Emission reductions achieved during the monitoring period as shown in MR is inconsistent with the corresponding ER spreadsheet in terms of values of parameters considered.				
b) Also, value of ER achieved during this monitoring period for each CPA as shown in MR is inconsistent with the corresponding ER spreadsheet.				
<b>Project participant response</b>				<b>Date :</b> 08/08/2016
a) Calculation of Emission reductions achieved during the monitoring period are now made consistent with the corresponding ER spreadsheet.				
b) The value of ERs achieved during the monitoring period for each CPA have now made consistent with the corresponding ER spreadsheet.				
<b>Documentation provided by project participant</b>				
Revised MR version 2				
<b>DOE assessment</b>				<b>Date:</b> 09/08/2016
a) CME as a response, have corrected the values of parameters considered for calculation of ER in line with corresponding ER spreadsheet. Verification team checked the ER spreadsheet and revised MR to confirm the consistency of values of parameters. Therefore, this CAR is closed.				
b) CME as a response, have corrected the value of ERs achieved for each CPA in revised MR in line with the actual calculated values of ERs achieved in ER spreadsheet. Verification team checked the ER spreadsheet and revised MR to confirm the consistency of values of ER achieved for each CPA. Therefore, this CAR is closed.				

Table 4. FAR from this verification

There is no FAR from this verification.

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### Document information

Version	Date	Description
01.0	5June 2015	Initial publication.

<i>Version</i>	<i>Date</i>	<i>Description</i>
Decision Class: Regulatory		
Document Type: Form		
Business Function: Issuance		
Keywords: programme of activities, verifying and certifying		