



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

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

BASIC INFORMATION

Title and UNFCCC reference number of the programme of activities (PoA)	Improved Cookstoves Program for Malawi and cross-border regions of Mozambique PoA 9558	
Version number(s) of the PoA-DD(s) to which this report applies	11	
Version number of the verification and certification report	2.1	
Completion date of the verification and certification report	06/09/2018	
Monitoring period number and duration of this monitoring period	Fourth monitoring period 16/04/2017 to 15/04/2018 (both days included)	
Number and version number of the monitoring report to which this report applies	Monitoring report number 1 Monitoring Report Version 02.2	
Coordinating/managing entity (CME)	C-Quest Capital Malaysia Global Stoves Limited (CQC)	
Host PartiesMalawi	Host Parties of the PoA	Is this a host Party to a CPA covered in this report? (yes/no)
	Malawi	Yes
Applied methodologies and standardized baselines	AMS-II.G: "Energy Efficiency Measures in Thermal Applications of Non-Renewable Biomass" (Version 05.0)	
Mandatory sectoral scopes linked to the applied methodologies	Sectoral scope 3: Energy demand	
Conditional sectoral scopes linked to the applied methodologies, if applicable	N/A	
Estimated amount of GHG emission reductions or GHG removals for this monitoring period in the included CPAs covered in this report	224,265 t CO ₂ e	
Certified amount of GHG emission reductions or GHG removals for this monitoring period for the included CPAs covered in this report	174,782 t CO ₂ e	
Name and UNFCCC reference number of the DOE	Earthood Services Private Limited (Earthood) E-0066	

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 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 five included CPAs (i.e. 9558-0001, 9558-0002, 9558-0003, 9558-0004 and 9558-0005) as part of registered PoA within the geographical boundary of Malawi.

Detailed implementation status of these 5 implemented CPAs has been discussed in subsequent sections of this report and CME has also reported the same in monitoring report, thus complying with §260 of CDM PS for PoA, V1/16/ and §339 of CDM VVS for PoA, V1/16/.

Earthood Services Private Limited has performed the Fourth 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., Version 05/19/. 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, first MP, second MP and third MP verification reports;
- (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/document review	On-site inspection	Interview(s)	Verification findings
1.	Team Leader, Verifier, Meth Expert 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	Mandal	Amit Ranjan	Central office
2.	Approver	IR	Singh	Dr. Kaviraj	Central office

SECTION C. Application of materiality in conducting the verification**C.1. Consideration of materiality in planning the verification**

No.	Risk that could lead to material errors, omissions or misstatements	Assessment of the risk		Response to the risk in the verification plan and/or sampling plan
		Risk level	Justification	
1.	Error in Data Transfer from Digital Records, Hard copy Records to ER Spread sheet for the monitoring parameters and sampling survey results. The errors could result from human errors during the information transfer from the source to emission reduction sheet.	High	The parameters were used in the calculation of emission reductions.	Since most of the monitoring parameter were confirmed through ex post monitoring survey conducted by CME, the verification team physically checked and verified the 28 households from fourth ex post monitoring survey records/4/ and ICS registration database/5/. Also compared PoA-DD/12/, CPA-DDs/12/ and reference documents with ER spread sheet/3/ to check for any material error during data transfer.

C.2. Consideration of materiality in conducting the verification

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The identified/selected materiality threshold for the PoA under current monitoring period is 5% as PoA is small scale in accordance with §307(d) of CDM VVS for PoA, V1/16/.

	MR Version (Draft)	MR Version (Final)
Emission reductions/annum	174,782	174,782
Identified Threshold	5.0%	5.0%

In accordance to the §28 of the applied methodology/19/, the sample size is determined by either 95/5 (for biennial inspection) or 90/10 (for annual inspection) confidence /precision. However, CME has considered 95/10 confidence /precision for annual sampling in the fourth ex post monitoring survey/4/. The verification team confirms that the sample size considered by CME is more conservative and shall give more accurate result.

Since most of the data is confirmed through ex post monitoring survey conducted by CME, the verification team has cross verified the ex-post survey data by applying acceptance sampling approach (28 number of households out of 235 number of households surveyed by CME). All ex-ante parameters were directly cross-checked from the PoA-DD/12/ and CPA-DD/12/. There was no gap identified in the values of ex-ante parameters.

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

D.2. On-site inspection

Duration of on-site inspection: 14/06/2018 to 16/06/2018				
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	Ntchisi, Dowa, Nkhonkhotakota, Kasungu and Lilongwe District of Malawi	14/06/2018 to 16/06/2018	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)			

D.3. Interviews

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1.	Goudwe	Vincent	Total Land Care (TLC)	14/06–2018 - 16/06/2018	Implementati on of CPAs, monitoring activities, record keeping	Akhilesh Joshi
2.	Njikho	Matias				
3.	Msachiwa	Onyx	CQC		Ex post Monitoring Survey	
4.	Garg	Vineet Kumar			Corrections in MR and ER sheet	
5.	Goswami	Tridip Kumar			Sampling approach, results and ER calculations	
6.	Yohane	Idah	Independent household representative	14/06/2018 - 16/06/2018	DOE Field Survey of ICS Users (Ntchisi, Dowa, Nkhotakota, Kasungu and Lilongwe District of	Akhilesh Joshi, Enea Katundu
7.	Kamundi	Maligelita				
8.	Faniwelo	Ketilina				
9.	Jefu	Alice				
10.	Andison	Mauakukonde				
11.	Chipala	Mtipundiza				
12.	Chigwetseni	Lute				
13.	Mavuto	Happiness				
14.	Isaac	Mwesani				

15.	Nzini	Lonile			Malawi)	
16.	Banda	Agnes				
17.	Mdoli	Vaniles				
18.	Chelani	Nalesi				
19.	Chigwalu	Velonika				
20.	Patrick	Julita				
21.	Kumbukani	Agnes				
22.	Vereni	Florence				
23.	Tembo	Kiliness				
24.	Msayiwale	Tiyamike				
25..	Mwale	Stella				
26.	Mvula	Dorothy				
27.	Mphamba	Namasito				
28.	Tuzija	Christina				
29.	Liness	Banda				
30.	Jositina	Arena				
31.	Ngonda	Stellia				
32.	Madalitso	Teleza				
33.	Chitsa	James				
34.	Saka	Kasimu	ICS Stove User	05/09/2018	Telephonic Interview	Enea Katundu

D.4. Sampling approach

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CME's sampling approach:

The CME has applied a sampling approach as per validated PoA-DD/12/ and registered CPA-DDs/12/. A confidence precision 95/10 was applied by CME in the annual sampling, which is appropriate given the length of the monitoring period. The sampling approach undertaken by CME is duly explained under Section E.3 of monitoring report/2/.

DOE's sampling approach:

In order to meet the requirements of §24 of Standard for "Sampling and surveys for CDM project activities and programmes of activities", Version 07/24/, the verification team applied acceptance sampling in the verification (in accordance with §27 of Standard for "Sampling and surveys for CDM project activities and programmes of activities", Version 07/24/). The verification team selected random sub-samples 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 07/24/:

- 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 in the Standard for "Sampling and surveys for CDM project activities and programmes of activities", Version 07/24/.

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 randomly¹ selected samples out of CME

¹ Using online software <https://www.randomizer.org/>

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 98.72%, 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/2/ and ER sheet/3/. Thus, CME's set of records has been accepted in line with §32 of the Standard for "Sampling and surveys for CDM project activities and programmes of activities", Version 07/24/.

The verification team together verified the 28 randomly selected samples out of CME 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_y as 24.68%, which is higher compared to the DOE onsite survey results. As there were no discrepant records, CME's set of samples were accepted in line with §32 of the Standard for "Sampling and surveys for CDM project activities and programmes of activities", Version 07/24/.

There was no DOE field survey conducted for efficiency related parameter as these were checked with the WBT records retained by the CME. The records were consistent with the reported results. The verification team randomly selected 20% of CME's WBT results and found them in order.

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

Areas of verification findings	No. of CL	No. of CAR	No. of FAR
General			
Compliance of the monitoring report with the monitoring report form	0	0	0
Remaining forward action requests from validation and/or previous verification	0	0	0
CPA(s) considered for verification and covered in this report	1	0	0
Programme of activities			
Compliance of the programme implementation with the registered PoA-DD	0	1	0
Implementation and operation of the management system	0	0	0
Post-registration changes			
<ul style="list-style-type: none"> Temporary deviations from the registered monitoring plan, applied methodology or applied standardized baseline 	0	0	0
<ul style="list-style-type: none"> Corrections 	0	0	0
<ul style="list-style-type: none"> Inclusion of a monitoring plan 	0	0	0
<ul style="list-style-type: none"> Permanent changes to the registered monitoring plan or permanent deviation of monitoring from the applied methodology, standardized baseline or other applied standards or tools 	0	0	0
<ul style="list-style-type: none"> Changes to the programme design or project design 	0	0	0
<ul style="list-style-type: none"> Change of coordinating/managing entity 	0	0	0
<ul style="list-style-type: none"> Changes specific to afforestation and reforestation activities 	0	0	0
Component project activities			
Compliance of the CPA implementation with the included CPA design document	1	0	0
Post-registration changes			
<ul style="list-style-type: none"> Temporary deviations from registered monitoring plan, applied methodology or applied standardized baseline 	0	0	0
<ul style="list-style-type: none"> Corrections 	0	0	0
<ul style="list-style-type: none"> Changes to the start date of the crediting period of component project activities 	0	0	0
<ul style="list-style-type: none"> Inclusion of a monitoring plan 	0	0	0

• Permanent changes to the registered monitoring plan or permanent deviation of monitoring from the applied methodology, standardized baseline or other applied standards or tools	0	0	0
• Changes to the programme design of project design	0	0	0
• Changes specific to afforestation and reforestation component project activities	0	0	0
Compliance of the registered monitoring plan with the methodology including applicable tool(s) and standardized baseline	0	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	1	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	0	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 CPA	0	0	0
• Remarks on difference from estimated value in included CPA	0	0	0
Assessment of reported sustainable development co-benefits	0	0	0
Global stakeholder consultation	0	0	0
Others (please specify)	0	0	0
Total	3	3	0

SECTION E. Verification findings

E.1. General

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

Means of verification	The verification team has compared the monitoring report/2/ with a latest applicable monitoring report form, version 02.0/22/. Same has been verified from UNFCCC website.
Findings	No finding has been raised.
Conclusion	The verification team confirms that the monitoring report has been appropriately prepared using the applicable monitoring report form/22/, and that all sections are complete.

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

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The verification team confirms that there are no pending FARs from validation and previous verification/13//14//21/.

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

Title and UNFCCC reference number of the CPA included in the PoA as of the end of this monitoring period	Is the CPA considered for this verification? (yes/no)	The date when the CPA was included	Version of the PoA-DD	Confirmation that a request for issuance including the CPA has been published for the previous monitoring period (Y/N)
Improved Cookstoves Program for Malawi and cross-border regions of Mozambique – CPA – MAL – 001; 9558-0001	Yes	13/03/2014	11	Yes
Improved Cookstoves Program for Malawi and cross-border regions of Mozambique – CPA – MAL – 002; 9558-0002	Yes	10/12/2014	11	Yes
Improved Cookstoves Program for Malawi and cross-border regions of Mozambique – CPA – MAL – 003; 9558-0003	Yes	10/12/2014	11	Yes
Improved Cookstoves Program for Malawi and cross-border regions of Mozambique – CPA – MAL – 004; 9558-0004	Yes	06/10/2016	11	Yes
Improved Cookstoves Program for Malawi and cross-border regions of Mozambique – CPA – MAL – 005; 9558-0005	Yes	06/10/2016	11	No, this is the first verification of this CPA.

E.2. Programme of activities**E.2.1. Compliance of the programme implementation with the registered programme design document**

Means of verification	The registered PoA involves the promotion, distribution and sale of improved cooking stoves (ICS) (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
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CME (CQC), which was also evident during the site visit. This is consistent with revised approved PoA-DD and CPA-DDs/12/.

This monitoring period includes the implementation and monitoring of all five implemented CPAs (CPA 9558-0001, 9558-0002, 9558-0003, 9558-0004 and CPA 9558-0005) as part of PoA/18/ (at the end of the current monitoring period) within the geographical boundary of Malawi. The implementation of all implemented CPAs, as referenced above, are within the geographical boundary of the PoA-DD (Section A.5.)/12/, which constitutes the physical boundary of PoA as well.

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 all CPAs is done by the TLC who is the sole CPA implementer for this PoA.

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/5/.

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:

CPA Reference Number	Total installed ICS (TLC Rocket)	Estimated in CPA-DD
9558-0001	19,907	20,763
9558-0002	19,469	20,763
9558-0003	20,763	20,763
9558-0004	18,460	20,763
9558-0005	8,593	20,763
Total	87,192	103,815

CPA Reference Number	Date of Installation of 1 st ICS	Date of registration (Earliest) of 1 st ICS
9558-0001	21/08/2013	20/10/2013
9558-0002	24/09/2013	10/12/2014
9558-0003	06/06/2015	20/10/2015
9558-0004	01/01/2016	23/07/2016
9558-0005	05/09/2016	14/11/2016

Therefore, the quantity, specification and target group of the ICS were found in accordance with the PoA-DD and respective CPA-DDs/12/. Further, based on the review of registration database of ICS/5/, physical observations and interview conducted during the site visit, the verification team found that the actual implementation on ground of the PoA is consistent with PoA-DD and respective CPA DDs/12/.

Findings

CAR-06 has been raised in this context and closed successfully. Refer Appendix 4 of this report for detailed finding.

Conclusion

The verification team confirms that -

- The physical features (technology/type of ICS) of the implementation were in accordance with the approved PoA-DD/12/.
- The distribution of ICS is still ongoing as it has not yet reached the estimated quantity given in the respective specific case CPA-DDs except for CPA 9558-0003/12/.

	<ul style="list-style-type: none"> • The actual operation is in line to respective CPA-DDs/12/, which is further explained under Section I.1 of this report. • No information with regard to data and variables was identified that may surpass the estimated quantity of ERs in the respective CPA-DDs/12/. • The emission reductions achieved for each specific case CPA DD were within the estimated quantity in the registered CPA-DDs/12/.
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E.2.2. Implementation and operation of the management system

Means of verification	<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/5/ 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/6/ 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>
Findings	No finding has been raised.
Conclusion	The verification team assessed the management systems in place to implement the monitoring of the PoA/12/. 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/2/. The verification team confirms that the monitoring management system of the PoA is in place with the responsibilities properly identified and established.

E.2.3. Post-registration changes

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

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No deviations were identified during the current monitoring period.

E.2.3.2. 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.

E.2.3.3. Inclusion of a monitoring plan

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Not applicable, since monitoring plan was included in the registered PoA-DD/12/.

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

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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.

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

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No changes to the programme design were identified during the current monitoring period.

E.2.3.6. Change of coordination/managing entity

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No changes in CME during the current monitoring period.

E.2.3.7. Changes specific to afforestation and reforestation activities

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Not Applicable.

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

Means of verification	<p>There are 05 specific CPAs (9558-0001, 9558-0002, 9558-0003, 9558-0004 and 9558-0005) included in the PoA/18/ at the end of the current monitoring period and all are covered in the current monitoring period. All 5 CPAs (9558-0001, 9558-0002, 9558-0003, 9558-0004 and 9558-0005) were implemented at the end of current monitoring period. The 5 implemented CPAs are grouped together in this section for 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. Although, the districts for all CPAs are common but stoves are separated by their unique serial numbers and fixed locations (household addresses). The implementation and operation status of each CPA has been verified as follows:</p> <p>CPA 9558-0001 (also referred to as CPA 001):</p> <p>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)/12/. By the end of current monitoring period total 19,907 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/12/. It has been checked by the verification team that the CPA is below the threshold of 180 GWh/year (thermal) (i.e. 147.46 GWh_{th} saving achieved during this monitoring period of 365 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</p>
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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 9558-0002 (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)/12/. Therefore, the Districts for CPA 002 are same as that of other included CPAs but stoves are separated by their unique serial numbers and fixed locations (household addresses). By the end of current monitoring period total 19,469 ICSs were disseminated under CPA 002, which is within estimated quantity of 20,763 as per Section A.3 of the CPA-DD/12/. It has been checked by the verification team that the CPA is below the threshold of 180 GWh/year (thermal) (i.e. 144.86 GWh_{th} saving achieved during this monitoring period of 365 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 d2ate 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)/12/. Therefore, the Districts for CPA 003 are same as that of other included CPAs, but stoves are separated by their unique serial numbers and fixed locations (household addresses). By the end of current monitoring period total 20,763 cook stoves were disseminated under CPA 003, which is equal to the estimated quantity of 20,763 ICSs as per Section A.3.of the CPA-DD/12/. It has been checked by the verification team that the CPA is below the threshold of 180 GWh/year (thermal) (i.e. 156.77 GWh_{th} saving achieved during this monitoring period of 365 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.

CPA 9558-0004 (also referred to as CPA 004):

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)/12/. Therefore, the districts for CPA 004 are same as that of other included CPAs, but stoves are separated by their unique serial numbers and fixed locations (household addresses). By the end of current monitoring period total 18,460 cook stoves were disseminated under CPA 004, which is less than the estimated quantity of 20,763 ICSs as per Section A.3. of the CPA-DD/12/. It has been checked by the verification team that the CPA is below the threshold of 180 GWh/year (thermal) (i.e. 99.07 GWh_{th} saving achieved during this monitoring period of 365 days). The distribution model in CPA 004 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. The operation/use of ICS starts from the installation date itself.

CPA 9558-0005 (also referred to as CPA 005):

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)/12/. Therefore, the districts for CPA 005 are same as that of other included CPAs, but stoves are separated by their unique serial numbers and fixed locations (household addresses). By the end of current monitoring period total 8,593 cook stoves were disseminated under CPA 005, which is less than the estimated quantity of 20,763 ICSs as per Section A.3. of the CPA-DD/12/. It has been checked by the verification team that the CPA is below the threshold of 180 GWh/year (thermal) (i.e. 46.80 GWh_{th} saving achieved during this monitoring period of 365 days). The distribution model in CPA 005 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. The operation/use of ICS starts from the installation date itself.

Based on review of the database for all 5 CPAs, stoves were sold throughout 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>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/12/.</p> <p>The final MR/2/ 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>
Findings	CL-01 has been raised in this context and closed successfully. Refer Appendix 4 of this report for detailed finding.
Conclusion	<p>The verification team confirms that physical features of the CPAs have been implemented in accordance with the registered CPA-DDs/12/. 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 CPAs have been implemented in accordance with the CPA-DDs/12/.</p> <p>The CPAs were also found to be completely operational in line with the CPA-DDs/12/. The information provided in the relevant sections of the monitoring report is appropriately described the implementation and operational status of the PoA/18/.</p>

E.3.2. Post-registration changes

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

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No deviations were identified during the current monitoring period.

E.3.2.2. Corrections

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There were corrections proposed as part of PRC-9558-001 request in which CPA DDs were revised for CPA 9558-0001, 9558-0002 and 9558-0003. The proposed PRC (Ref: [PRC-9558-001](#)) was accepted and approved on 11/08/2015. No corrections were identified during the current monitoring period.

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

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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/18/.

CPA	Initial start date of crediting period	Revised start date of crediting period
9558-0003	10/12/2014	20/10/2015
9558-0005	07/10/2016	16/04/2017

E.3.2.4. Inclusion of a monitoring plan

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Not Applicable.

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

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There were permanent changes in monitoring plan proposed as part of PRC-9558-001 request in which CPA DDs were revised for CPA 9558-0001, 9558-0002 and 9558-0003. The proposed PRC (Ref: [PRC-9558-001](#))

was accepted and approved on 11/08/2015. No permanent changes were identified during the current monitoring period.

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

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No such changes were identified during the current monitoring period.

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

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Not Applicable.

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

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

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

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

Means of verification	<p>The values of B_{old}, f_{NRB,y}, η_{old}, EF_{projected_fossilfuel}, NCV_{biomass} and L 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/12/.</p> <ol style="list-style-type: none"> 1. Data/Parameter, Unit: B_{old}, 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/12/ and fixed ex-ante. 2. Data/Parameter, Unit: f_{NRB,y}, 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_{NRB}</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/12/ and fixed ex-ante. 3. Data/Parameter, Unit: η_{old}, 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 05/19/. Consistent with the approved revised PoA-DD and respective CPA-DDs/12/ and fixed ex-ante. 4. Data/Parameter, Unit: EF_{projected_fossilfuel}, tCO₂/TJ Description: Emission factor: substitution of non-renewable woody biomass by 	Region	f _{NRB}	Central	0.97	Northern	0.93	Southern	0.90
Region	f _{NRB}								
Central	0.97								
Northern	0.93								
Southern	0.90								

	<p>similar consumers Verified Value: 81.6 IPCC 2006 default value in accordance with applied methodology AMS II.G, version 05/19/. Consistent with the approved revised PoA-DD and respective CPA-DDs/12/ and fixed ex-ante</p> <p>5. Data/Parameter, Unit: NCV_{biomass}, TJ/ tonne Description: Net calorific value of the non-renewable woody biomass that is substituted Verified Value: 0.015 IPCC 2006 default value for biomass applied. Consistent with the approved revised PoA-DD and respective CPA-DDs/12/ and fixed ex-ante.</p> <p>6. Data/Parameter, Unit: L , Fraction Description: Leakage adjustment factor Verified Value: 0.95 Default value in accordance with paragraph 20 of the AMS II.G, version 05/19/. Consistent with the approved revised PoA-DD and respective CPA-DDs/12/ and fixed ex-ante.</p>
Findings	No finding has been raised.
Conclusion	The values of ex ante fixed parameters have been verified from the approved revised PoA-DD and respective CPA-DDs/12/. Same has been cross checked 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.

E.3.4.2. Data and parameters monitored

Means of verification	<p>The monitoring has been carried out in accordance with the monitoring plan contained in the approved revised PoA-DD and respective CPA-DDs/12/. During the verification, all relevant monitoring parameter have been verified about 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: $n_{y,j}$, quantity 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 annual as mentioned in the CPA-DD (page 24) and PoA-DD (page 31)/12/. In accordance with Section B.7.2 of PoA-DD/12/, 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/12/ 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

	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 5 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/10/. There were two questions asked in this regard –</p> <p>a) Is the stove operational? b) Are TLC Rocket Stove used in the cooking in the household?</p> <p>If the answer to Question a) is Yes and answer to Question b) is No, still the ICS is considered non-operational, since it is not being used for cooking purpose. During the survey, 100% user replied as ICS in working condition, but 3 users told that they were not using ICS for</p>

		<p>cooking purpose. CME has considered these 3 stoves as non-operational for calculation of the parameter, which is considered a conservative approach.</p> <p>This survey provided the value for the p_y (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.</p> <table border="1" data-bbox="997 521 1385 779"> <tr> <td>ICS found operating</td> <td>232</td> </tr> <tr> <td>ICS found non-operating</td> <td>3</td> </tr> <tr> <td>Total responded samples</td> <td>235</td> </tr> <tr> <td>$p(\text{operating})$</td> <td>98.72%</td> </tr> </table> <p>The number of stoves still in operation is determined as below-</p> <p>9558-0001: $19,907 \times 98.72\% = 19,652$ units 9558-0002: $19,469 \times 98.72\% = 19,220$ units 9558-0003: $20,763 \times 98.72\% = 20,497$ units 9558-0004: $18,460 \times 98.72\% = 16,224$ units 9558-0005: $8,593 \times 98.72\% = 8,483$ 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/12/. The verified values are included in the final MR/2/. The required level of precision i.e. 10% or less has been achieved at 95% confidence level.</p>	ICS found operating	232	ICS found non-operating	3	Total responded samples	235	$p(\text{operating})$	98.72%
ICS found operating	232									
ICS found non-operating	3									
Total responded samples	235									
$p(\text{operating})$	98.72%									
	<p>If applicable, has the reported data been cross-checked with other available data?</p>	<p>Yes. The survey results/6/, assumptions and sales records were checked by the verification team and were found acceptable. The results are reproducible in the corresponding ER spreadsheet/3/ of final MR/2/. 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>								

	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes. The QA/QC procedure are in place, internal checks have been done by the CPA implementer and established during the on-site assessment.
	<p>2. Data/Parameter, Unit: SS_y, Percentage</p> <p>Description: The percentage of ongoing baseline stove use within the population of in-use ICS during a monitoring period</p>	
	Measuring /Reading /Recording frequency	The monitoring frequency is annually as mentioned in the CPA-DD and PoA-DD (page 32)/12/. 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/12/ 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
	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 5 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/10/. This survey provided the value for the SSy 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 the verification team and found to be appropriate and consistent with equation in PoA-DD/12/. The value of SSy, thus determined, is used further in calculation of B_{old, adjusted}.</p> <table border="1"> <thead> <tr> <th></th> <th>Baseline stove</th> </tr> </thead> <tbody> <tr> <td>Baseline Stove not in use</td> <td>177</td> </tr> <tr> <td>Baseline Stove in use</td> <td>58</td> </tr> <tr> <td>Total Samples Surveyed</td> <td>235</td> </tr> <tr> <td>p(baseline stove not in use)</td> <td>75.32%</td> </tr> </tbody> </table> <p>The verified values are included in the final MR/2/. 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"> <tbody> <tr> <td>ICS Model</td> <td>SSy for all CPAs</td> </tr> <tr> <td>TLC Rocket</td> <td>24.68%</td> </tr> </tbody> </table>		Baseline stove	Baseline Stove not in use	177	Baseline Stove in use	58	Total Samples Surveyed	235	p(baseline stove not in use)	75.32%	ICS Model	SSy for all CPAs	TLC Rocket
	Baseline stove														
Baseline Stove not in use	177														
Baseline Stove in use	58														
Total Samples Surveyed	235														
p(baseline stove not in use)	75.32%														
ICS Model	SSy for all CPAs														
TLC Rocket	24.68%														

	If applicable, has the reported data been cross-checked with other available data?	Yes. The survey results/6/ were checked by the verification team and were found acceptable. The results are reproducible in the corresponding ER spreadsheet/3/ of final MR/2/. The verification team randomly selected 28 samples for DOE's field survey and found that only 4 (14.28%) traditional stoves were operational along with ICS installed, which confirms the CME's sample survey results are appropriate. 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.
	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	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.
	3. Data/Parameter, Unit: $t_{y,j}$, 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 and recorded annually 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)/12/.
	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:</p> $t_{y,j} = (\text{Date of end of monitoring period} - \text{Date of stove registration}) / \text{Length of monitoring period}$ <p>The maximum value for any stove can be 1 e.g., for ICS registered prior to commencement of current monitoring period. The lowest can be 0 e.g., for ICS registered after the end date of current monitoring period. For all other ICS, in between, the value will result in fraction. The verification team has verified that the application of formula results in appropriate output as it also considers the start date of respective CPA. Finally, an average value was calculated for all ICS sold/distributed for each CPA. The verified results are included in the final MR/2/ and corresponding ER spreadsheet/3/. The verified results were:</p> <p>Average CPA 1: 0.98 Average CPA 2: 1.00 Average CPA 3: 1.00 Average CPA 4: 0.71 Average CPA 5: 0.76</p>
	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/5/ (for dates), relevant dates of crediting and monitoring period as presented in ER spreadsheet/3/.

	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) 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.
	4. Data/Parameter, Unit: $\eta_{new,y,i}$, Fraction Description: Continuing efficiency of ICS	
	Measuring /Reading /Recording frequency	Calculated once in a year using Water Boiling Test/23/.
	Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes. as per PoA-DD (page 32)/12/.
	Monitoring equipment	The WBT tests were coordinated by the CME and undertaken following a simplified version of WBT protocol 4.2.3/23/ by an experienced party. The PoA-DD or CPA-DDs /12/ 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 E.3.4.4 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 complies 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 E.3.4.4 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 E.3.4.4 of this report
	Is the calibration of measuring equipment carried out by an accredited person or institution?	Please refer Section E.3.4.4 of this report
	Is(are) calibration(s) valid for the whole reporting period?	Please refer Section E.3.4.4 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 E.3.4.4 of this report
	How were the values in the monitoring report verified?	<p>The reported values were checked with the actual WBT results/4/ and CME filled in Sheets (for this purpose)/10/ 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 E.3.4.3 of this report.</p> <p>The efficiency of the TLC Rocket stove in CPA-DD and PoA-DD/12/ was assumed based on efficiency value of ICS from the WBT test conducted by ICS promoter Total Land Care on request from CQC (CME). However, during the actual WBT test carried out by third party the actual efficiency of ICS varied from 25.20% to 28.80% for vintage 1 ICS, from 25.11% to 29.42% for vintage 2 ICS, from 24.15% to 26.12% for vintage 3 ICS, from 25.10% to 29.23% for vintage 4 ICS and from 24.81% to 29.30% for vintage 5 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 several 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; Vintage 1: 0.2697 Vintage 2: 0.2737 Vintage 3: 0.2518 Vintage 4: 0.2725 Vintage 5: 0.2750</p>

	If applicable, has the reported data been cross-checked with other available data?	Yes. The data has been cross-checked with the estimated efficiency (25.66%) in the registered CPA-DDs/12/. The actual efficiencies in this monitoring period were slightly higher, which is based on actual WBT tests/6/ conducted at ICS user premises and hence acceptable.
	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	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 4.2.3/23/ was applied, which is acceptable.
Findings	CAR-02 has been raised in this context and closed successfully. Refer Appendix 4 of this report for detailed finding.	
Conclusion	Corresponding to the §345 of CDM VVS for PoA,V1/16/, the verification team confirm that the monitoring has been carried out in accordance with the approved revised PoA-DD and CPA-DDs/12/. The monitoring system follows the information flow for the parameters as mentioned in monitoring plan in approved revised PoA-DD and registered CPA-DDs/12/. The monitored data for the parameters has been verified by checking the procedure for information flow and found to be complete and consistent with registered CPA-DDs/12/.	

E.3.4.3. Implementation of sampling plan

Means of verification	<p>The monitoring has been carried out in accordance with the monitoring plan contained in the PoA-DD and respective CPA-DDs /12/.</p> <p>Sampling Design/Target Population/Sampling Frame/Reliability: A simple random sampling method has been used, which is in line with the monitoring plan of the PoA-DD (Section B.7.2) as referred in the respective CPA-DDs /12/. In this sampling design all 5 CPAs that are implemented under the current monitoring period were subjected. The sampling frame considered confidence level and precision as 95/10 for annual sampling survey in order to meet the requirement of Standard/24/. As there is only one CPA implementer, it was considered as Primary Sample Unit. The target population was the households located in various districts in Malawi. Each household from each CPA had the equal chance of selection.</p> <p>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.</p> <p>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</p> <p>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:</p>
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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 /4/ was checked and found correct as per registered monitoring plan.

The sample size for $n_{new,i}$ 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	$n_{new,i}$ (actual sampling done mentioned in bracket)				
	Vintage 1	Vintage 2	Vintage 3	Vintage 4	Vintage 5
TLC Rocket Stove	12(16)	12 (16)	8(12)	13 (16)	12(17)

As can be seen that the sampling requirements were met for TLC Rocket Stove for all vintages. The actual surveyed ICS were higher than 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 districts 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/25/. 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 sample size calculation spreadsheets/4/ 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 07)/24/ and can confirm that the calculation of achieved reliability was done correctly. The verification team confirmed from the sample size calculation spreadsheet/4/ 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	87,192	Project database (Number of stoves registered in database till 15/02/2017)
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 (Roundup Value)

The following table represents precision achieved after the survey, as an example, for the same parameter of interest (i.e. $n_{y,j}$) discussed above.

Parameter	Value	Source/ basis
n	235	Actual sample size surveyed by CME
Overall Proportion	98.72%	Actual value
Confidence Level	1.96	95% confidence level
Precision achieved	1.45%	Calculated
Is required precision achieved?	Yes	< 10%

In the same manner, all parameters of interest are included in the Sample Size Calculation spreadsheet/4/. 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 Sample Size Calculation Spreadsheet/4/ corresponding to final Monitoring Report/2/, which were also found correct.

Table – Actual Precision Achieved based on Survey results

Monitoring Parameter	Precision Achieved	Is required Precision achieved? (< 10%)
$n_{y,j}$	1.45%	Yes
SS_y	7.31%	Yes
$\eta_{new,l}$ (Vintage 1)	9.43%	Yes
$\eta_{new,l}$ (Vintage 2)	9.90%	Yes
$\eta_{new,l}$ (Vintage 3)	6.46%	Yes
$\eta_{new,l}$ (Vintage 4)	8.26%	Yes
$\eta_{new,l}$ (Vintage 5)	9.62%	Yes

Based on the verified results the verification team found that the required precision is met in all the cases and therefore the survey results/4/ were directly used in the calculation of ERs.

Findings	CL-05 has been raised in this context and closed successfully. Refer Appendix 4 of this report for detailed finding.
Conclusion	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 implementer is in accordance with §24 of Standard for “Sampling and surveys for CDM project activities and programmes of activities” (version 07)/24/.

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

Means of verification	The registered monitoring plan (of respective CPA-DDs and PoA-DD/12/) does not state the calibration requirements for any of the parameter. However, as good practice, the verification team enquired information with regard to monitoring equipment viz., weighing scale and thermometer that were used to conduct the parameter “Efficiency of the new stove”. As a result, following information was
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	verified;		
	Instrument	Model	Other details
	Weighing Scale	Ohaus Portable Balances – Valor 1000 V11P6-AM	Range: upto 6 kg ($\pm 1g$) 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 /8/ First Calibration Date: 02/02/2017 /8/ Second Calibration Date: 04/12/2017 /8/ Due date of Next Calibration: 03/12/2020 Calibration Agency: Metrology Services Department, Malawi Bureau of Standards
	Digital Thermometer	Fluke 51-2 Single Input Digital Thermometer	Thermocouple Type: Type K, Chromel Alumel, bead style Range: - 40 °C to +260 °C ($\pm 0.35^{\circ}\text{C}$) Calibration frequency: Annual/9/ Date of purchase: 21/09/2015 /9/ First Calibration Date: 02/02/2017 /9/ Second Calibration Date: 17/11/2017/9/ Due date of Next Calibration: 16/11/2018 Calibration Agency for second calibration: Metrology Services Department, Malawi Bureau of Standards
	<p>For electronic weighing scale, manufacturer/8/recommended for span calibration by user based on the procedure specified in the manual before first use. 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 arises. 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 20/09/2018 (3 years from date of purchase i.e. 21/09/2015). During on site verification, DOE observed that weighing scales have been calibrated on 02/02/2017 and 04/12/2017, which is before the due date of calibration (i.e. 20/09/2018). Therefore, it can be stated that it was in worthy state of use.</p> <p>For digital thermometers, manufacturer recommended/9/ that, the thermometer should be calibrated annually starting one year after purchase/9/ (Referred page 13 of user manual provided by Manufacturer). During on site verification, DOE observed that CME has calibrated the thermometers on 17/11/2017 /9/, which is before the due date of second calibration (i.e. 01/02/2018). Thus, the thermometers are considered worthy of use during the last monitoring WBT test conducted between 21/03/2018 to 05/04/2018.</p>		
Findings	CAR-03 has been raised in this context and closed successfully. Refer Appendix 4 of this report for detailed finding.		
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 CME was accepted.		

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

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

Means of verification	The following equations were used to determine the baseline emissions as
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provided in the monitoring report/2/ and applied in the corresponding ER sheet/3/. The expressions used were found consistent with the revised PoA-DD and CPA-DDs/12/ and the applied methodology AMS-II.G, version 05/19/:

$$ER_y = B_{y,savings} \cdot f_{NRBy} \cdot NCV_{biomass} \cdot EF_{projected_fossilfuel} \cdot L$$

Total biomass that is saved in tonnes during the monitoring year (y) $B_{y,savings}$, is calculated using the equation below:

$$B_{y,savings} = B_{old} \cdot \left(1 - \frac{\eta_{old}}{\eta_{new}} \right)$$

To determine the number of stoves under operation for fractions of the monitoring period, the following formula is used:

$$N_{y,i} = \sum_{j=1}^{J_y} n_{y,j} \cdot t_{y,j}$$

Therefore, $B_{y,savings}$ is calculated using the following expression:

$$B_{y,savings} = B_{old,adjusted} \cdot \left[\sum_{i=1}^n N_{y,i} \left(1 - \frac{\eta_{old}}{\eta_{new,i}} \right) \right]$$

Further the value of $B_{old,adjusted}$ is calculated for each CPAs for separately as under:

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

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;

Vintage (Type)	Cut-off date (Installation Date of ICS)	Remarks
Vintage 1	Between 16/04/2017 to 15/04/2018	Up to 1-year old registered ICS
Vintage 2	Between 16/04/2016 to 15/04/2017	Up to 2 years old registered ICS
Vintage 3	Between 16/04/2015 to 15/04/2016	Up to 3 years old registered ICS
Vintage 4	Between 16/04/2014 to 15/04/2015	Up to 4 years old registered ICS
Vintage 5	On or before 15/04/2014	Up to 5 years old registered ICS

Owing to the age of ICS, its efficiency may generally decrease over a period 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/3/ to the final Monitoring Report/2/ has considered the number of stoves as per the vintage and accordingly the efficiency of such stoves in the ER calculation for each CPA.
Findings	No Finding has been raised.
Conclusion	The verification team confirms that - <ul style="list-style-type: none"> a) A complete set of data for the monitoring period was available and the verification of each monitoring parameter is elaborated under Section E.3.4.2 of this report. The complete monitoring data is also presented in the corresponding ER sheet /3/ of final Monitoring Report /2/; b) As indicated above, the description about cross-check of reported data is included under respective parameter (refer Section E.3.4.2 of this report); c) Appropriate methods and formulae for calculating baseline GHG emissions or baseline net GHG removals were followed; d) All assumptions used in the emission calculations were found appropriate and therefore justified; e) Appropriate emission factors, IPCC default factors and other reference values were correctly applied. This has also been elaborated under Section E.3.4.1 of this report; f) There is no pro-rate approach (§359(e) of CDM VVS for PoA V1/16/) 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.

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

Means of verification	The PoA-DD/12/, CPA-DD/12/ and applied monitoring methodology/19/ does not prescribe any project emissions to be considered. The onsite visit and project design also did not reveal any potential source to be considered in this regard.
Findings	No finding has been raised.
Conclusion	No additional project emissions calculation were required in accordance with the methodology AMS-II.G, version 05/19/.

E.3.5.3. Calculation of leakage GHG emissions

Means of verification	The PoA-DD/12/, CPA-DD/12/ and applied monitoring methodology/19/ does not prescribe any leakage emissions to be considered. The onsite visit and project design also did not reveal any potential source to be considered in this regard. However, the leakage adjustment factor that is required to adjust the baseline emissions has been duly accounted in baseline calculations.
Findings	No finding has been raised.
Conclusion	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 05/19/.

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

Means of verification	As elaborated above, the entire emission reductions from the PoA were based on baseline emissions. The calculations presented in this regard in the final monitoring report/2/ and corresponding ER sheet/03/ were found appropriate and complying with the provisions prescribed in the registered monitoring plan of respective CPA DD/12/, PoA DD/12/ and applied methodology/19/. The verification team confirms that an audit trail that contains the evidence and records that validated the stated figures were checked and found acceptable.
Findings	No finding has been raised.
Conclusion	The verification team confirms that: <ul style="list-style-type: none"> a) The complete data was available and is duly reported; b) As indicated above, the description about cross-check of reported data is included under respective parameter (refer Section E.3.4.2 of this report);

	<p>c) Appropriate methods and formulae for calculating baseline GHG emissions or baseline net GHG removals, project emissions and leakage emissions were followed;</p> <p>d) Appropriate emission factors, IPCC default factors and other reference values were correctly applied;</p> <p>e) There is no pro-rate approach (§359(e) of CDM VVS for PoA V1/16/) 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.</p> <p>f) The total number of ERs achieved during the current monitoring period is 174,782 tCO₂e.</p>
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Title and UNFCCC reference number of the CPA	Baseline emissions or baseline net GHG removals by sinks (tCO ₂ e)	Project emissions or actual net GHG removals by sinks (tCO ₂ e)	Leakage (tCO ₂ e)	GHG emission reductions or net GHG removals by sinks (tCO ₂ e)		
				Amount achieved before 1 January 2013	Amount achieved from 1 January 2013	Amount achieved in the entire monitoring period
Improved Cookstoves Program for Malawi and cross-border regions of Mozambique – CPA – MAL – 001; 9558-0001	43,318	0	0	0	43,318	43,318
Improved Cookstoves Program for Malawi and cross-border regions of Mozambique – CPA – MAL – 002; 9558-0002	42,557	0	0	0	42,557	42,557
Improved Cookstoves Program for Malawi and cross-border regions of Mozambique – CPA – MAL – 003; 9558-0003	46,053	0	0	0	46,053	46,053

Improved Cookstoves Program for Malawi and cross-border regions of Mozambique – CPA – MAL – 004 ; 9558-0004	29,105	0	0	0	29,105	29,105
Improved Cookstoves Program for Malawi and cross-border regions of Mozambique – CPA – MAL – 005 ; 9558-0005	13,749	0	0	0	13,749	13,749
Total	174,782	0	0	0	174,782	174,782

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

Means of verification	<p>As verified and evident from the final Monitoring Report /2/ and corresponding ER sheet/03/, 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/12/ for the comparable period except for the CPA 9558-0003. This is due to lower number of ICS distributed under each CPA due to operational difficulties.</p> <p>However, due to achieving higher thermal efficiency compared to the ex-ante assumed value in CPA-DDs/12/, the actual emission reduction achieved for CPA 9558-0003 is 2.68% higher compared to ex ante estimates of respective CPA-DDs/12/. In included CPA-DDs/12/ the efficiency of ICS was assumed as 25.66%, however during 4th monitoring survey the thermal efficiency of ICS comes out to be Vintage 1: 26.97%, Vintage 2: 27.37%, Vintage 3: 25.18%, Vintage 4: 27.25% and Vintage 5: 27.50%. Verification team checked the WBT test reports/6/ for all vintages on sample basis and found them in line with the WBT protocol/23/.</p>
Findings	No finding has been raised.
Conclusion	The actual emission reductions achieved in each specific CPA were not higher than the estimated quantity of ERs in the respective CPA-DDs/12/ except for CPA 9558-0003, which is properly justified in MR/2/. Therefore, it was accepted by the verification team.

Title and UNFCCC reference number of the CPA	Value estimated in ex ante calculation in the included CPA-DD(s)	Actual values achieved by the CPAs during this monitoring period
9558-0001	44,853 tCO ₂ e	43,318 tCO ₂ e
9558-0002	44,853 tCO ₂ e	42,557 tCO ₂ e
9558-0003	44,853 tCO ₂ e	46,053 tCO ₂ e

9558-0004	44,853 tCO ₂ e	29,105 tCO ₂ e
9558-0005	44,853 tCO ₂ e	13,749 tCO ₂ e
Total	224,265 tCO₂e	174,782 tCO₂e

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

Means of verification	The actual emission reductions achieved for individual CPAs were less than the estimation in the CPA-DDs/12/ for an equivalent length of the monitoring period, except for CPA 9558-0003. An explanation has been added in the MR as well as section E.3.5.5 of this report in this regard.
Findings	No finding has been raised.
Conclusion	The actual ERs are less than the estimated quantity of ERs as given in the respective CPA-DDs, except for CPA 9558-0003. This is properly addressed in MR/2/ and accepted.

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

Means of verification	Not Applicable.
Findings	Not Applicable.
Conclusion	Not Applicable.

E.3.7. Global stakeholder consultation

Means of verification	Not Applicable.
Findings	Not Applicable.
Conclusion	Not Applicable.

SECTION F. Internal quality control

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The draft verification report that is prepared by verification team is reviewed by an independent technical review team (one or more members) to confirm if the internal procedures established and implemented by ESPL were duly complied with and whether such opinion/conclusion were reached in an objective manner that complies with the applicable CDM rules/requirements. The technical review team is collectively required to possess the technical expertise of all the technical area/ sectoral scope the project activity relates to. All team members of technical review team are independent of the verification team.

During the technical review process additional findings may be identified or the closed-out findings may be opened, which needs to be satisfactorily resolved before the request for issuance is submitted to UNFCCC. The independent technical reviewer may either approve the report as such or reject/return the same in such case providing the comments/findings/issues that needs to be resolved by the verification team. The decision taken by the Technical Reviewer is final and is authorized by the Managing Director on behalf of Earthood Services Private Limited.

SECTION G. 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 fourth independent verification of the emission reductions for the registered CDM PoA 9558 "Improved Cookstoves Program for Malawi and cross-border regions of Mozambique" in Malawi for the monitoring period 16/04/2017 to 15/04/2018 as reported in the Monitoring Report (public) Version 01 dated 20/05/2018. 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, 9558-0003, 9558-0004 and 9558-0005), 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 § 22 and 23 of CDM VVS for PoA, V1/16/.

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/12/ as well as comply with applicable CDM rules and regulations and in accordance with applied monitoring methodology AMS II.G. Version 05/19/. There were no issues that were raised as FAR during validation, PRC validation and previous verification, which required further attention from the verification team.

As a result, it is confirmed that the emission reductions as 174,782 tCO₂e from the CDM PoA 9558 "Improved Cookstoves Program for Malawi and cross-border regions of Mozambique" are correctly reported in the Monitoring Report (final) Version 02.2 dated 04/09/2018 and corresponding ER spreadsheet for the monitoring period 16/04/2017 - 15/04/2018 (including both days). Therefore, this will be submitted as part of request for issuance as per CDM PCP for PoA, V1/16/.

SECTION H. 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 16/04/2017 - 15/04/2018 (including both days) are fairly stated in the Monitoring Report (final) Version 02.2 dated 04/09/2018.

ESPL, based on outcome of verification activities, certify in writing that, during the monitoring period 16/04/2017 - 15/04/2018 (including both days), the registered CDM PoA 9558 "Improved Cookstoves Program for Malawi and cross-border regions of Mozambique" and all of the included CDM CPAs (9558-0001, 9558-0002, 9558-0003, 9558-0004 and 9558-0005) in the registered CDM PoA achieved the verified amount of 174,782 tCO₂e reductions in anthropogenic emissions by sources of greenhouse gases that would not have occurred in the absence of the CPAs.

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

CPAs (included in this Issuance request)	Emission Reductions achieved in this monitoring period	
	Up to 31/12/2012 (1 st commitment period)	01/01/2013 onwards (2 nd commitment period)
CPA 9558-0001	NIL	43,318
CPA 9558-0002	NIL	42,557
CPA 9558-0003	NIL	46,053
CPA 9558-0004	NIL	29,105
CPA 9558-0005	NIL	13,749
Total	NIL	174,782

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 ₂ 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 _{th}	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			
Name	Akhilesh Joshi		
Country	India		
Education	B.Tech. (Chemical Engineering), MNIT Jaipur MBA (Oil & Gas), UPES Dehradun		
Experience	17 Years +		
Field	Cement, Energy Efficiency, Climate Change		
Approved Roles			
Team Leader	YES		
Validator	YES		
Verifier	YES		
Methodology Expert	AMS-I.D., AMS-II.G., AMS-II.J., ACM0001, ACM0002, ACM0004		
Local expert	YES (India)		
Financial Expert	NO		
Technical Reviewer	NO		
TA Expert	YES (TA 1.2, TA 3.1, TA 4.1)		
Reviewed by	Abhishek Mahawar	Date	01/03/2018
Approved by	Ashok Kumar Gautam	Date	01/03/2018

Competence Statement			
Name	Enea Katundu		
Country	Malawi		
Education	Master of Science		
Experience	3 Yrs +		
Field	Research and Social Empowerment		
Approved Roles			
Team Leader	NO		
Validator	NO		
Verifier	NO		
Methodology Expert	NO		
Local expert	YES (Malawi)		
Financial Expert	NO		
Technical Reviewer	NO		
TA Expert	NO		
Reviewed by	Abhishek Mahawar	Date	01/03/2018
Approved by	Ashok Kumar Gautam	Date	01/03/2018

Competence Statement			
Name	Amit Ranjan Mandal		
Country	India		
Education	Master of Science (Energy Management)		
Experience	9.5 yrs		
Field	Environmental, Energy, CDM		
Approved Roles			
Team Leader	YES		
Validator	YES		
Verifier	YES		
Methodology Expert	ACM0002, AMS.I.D		
Local expert	YES (India)		
Financial Expert	YES		
Technical Reviewer	YES		
TA Expert	YES (TA 1.2, TA 3.1)		
Reviewed by	Abhishek Mahawar	Date	01/03/2018
Approved by	Ashok Kumar Gautam	Date	01/03/2018

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) Monitoring Report (intermediate version)	Version 1 dated 20/05/2018 Version 2 dated 28/06/2018 Version 02.1 dated 23/07/2018	CME
2	CQC	Monitoring Report (final version)	Version 02.2 dated 04/09/2018	CME
3	CQC	ER spread sheet corresponding to webhosted MR ER spread sheet corresponding to MR (final version)	Version 1 dated 20/05/2018 Version 02.1 dated 23/07/2018	CME
4	CQC	Sample Size Calculation Spreadsheet (for Sample size and precision calculation spreadsheet – prior to survey and after the survey)	Dated 04/09/2018	CME
5	CQC	ICS registration database till end date of 4 th MP (i.e. 15/04/2018)	-	CME
6	CQC	Reports of sampling survey conducted including WBT Tests for individual ICS	-	CME
7	CQC	Technical Specification of TLC Rocket Stove ICS distributed from Manufacturer /	-	CME

		supplier (including photos of some installed ICSs)		
8	CQC Malawi Bureau of Standard	<ul style="list-style-type: none"> Purchase receipts and User Manual of the weighing scale used for WBT tests Certificate of Calibration of Weighting Scale issued by third party (i.e. Metrology Services Department, Malawi Bureau of Standards) 	Dated 21/09/2015 Dated 02/02/2017 and 04/12/2017	CME
9	CQC Malawi Bureau of Standard	<ul style="list-style-type: none"> Purchase receipts and User Manual of the thermometer used for WBT tests Certificate of Calibration of Thermometers issued by third party (i.e. Metrology Services Department, Malawi Bureau of Standards) 	Dated 21/09/2015 Dated 02/02/2017 and 17/11/2017	CME
10	CQC	Sample copies of filled survey questionnaire during monitoring survey and WBT test reports	-	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 Mozambique" UNFCCC PoA9558 - PoA –DD version 11 dated 27/04/2015 CPA-DD 9558-0001 version 11 dated 10/05/2015 CPA-DD 9558-0002 version 05 dated 10/05/2015 CPA-DD 9558-0003 version 05 dated 10/05/2015 CPA-DD 9558-0004 version 01.1 dated 28/09/2016 CPA-DD 9558-0005 version 01.1 dated 28/09/2016	Web link	Others
13	TUV SUD	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 PoA 9558	Web link	Others
14	ESPL	PRC Validation Opinion (Version 02 dated 10/06/2015) for "Improved Cookstoves Program for Malawi and cross-border regions of Mozambique" UNFCCC PoA9558	Web link	Others
15	TUV SUD	CPA 9558-0003 inclusion validation report for "Improved Cookstoves Program for Malawi and cross-border regions of Mozambique" UNFCCC PoA 9558	Web link	Others
16	CDM EB	a) CDM Validation and Verification Standard for PoA b) CDM Project Standard for PoA	Version 01	Others

		c) CDM Project Cycle Procedure for PoA		
17	CDM EB	E-mail from CDM Secretariat confirming the monitoring report /01/ made publicly available from 23/05/2018	Email dated 23/05/2018 from CDM RIT team	Others
18	CDM EB	UNFCCC project page of PoA reference number (9558)	Web link	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)	EB 70, Annex 30 dated 23/11/2012	Others
20	-	Websites referred: a. http://cdm.unfccc.int/index.html b. http://www.itouchmap.com/latlong.html c. http://www.ipcc-nggip.iges.or.jp/	-	Others
21	ESPL	<ul style="list-style-type: none"> 1st MP Verification Report for "Improved Cookstoves Program for Malawi and cross-border regions of Mozambique" UNFCCC PoA 9558 2nd MP Verification Report for "Improved Cookstoves Program for Malawi and cross-border regions of Mozambique" UNFCCC PoA 9558 3rd MP Verification Report for "Improved Cookstoves Program for Malawi and cross-border regions of Mozambique" UNFCCC PoA 9558 	version 01 dated 30/09/2014 version 03 dated 28/10/2016 version 02 dated 07/07/2017	Others
22	CDM EB	Monitoring Report Form for CDM programme of activities along with Instruction for filling out monitoring report	Version 02.0 dated 07/06/2017	Others
23	Global Alliance for Clean Cookstoves	The Water Boiling Test Protocol	Version 4.2.3	Others
24	CDM EB	Standard: Sampling and surveys for CDM project activities and programme of activities	Version 07	Others
25	CDM EB	Guideline: Sampling and surveys for CDM project activities and programme of activities	Version 04	Others
26	CQC	Scanned copy of filled survey questionnaire during monitoring survey for stove ID TLC046252	-	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 remaining FAR from validation or previous verification report.

FAR ID	xx	Section no.	Date: DD/MM/YYYY
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Description of FAR	
Project participant response	Date: DD/MM/YYYY
Documentation provided by project participant	
DOE assessment	Date: DD/MM/YYYY

Table 2. CL from this verification

CL ID	01	Section no.	E.3.1	Date : 21/06/2018
Description of CL				
As mentioned in footnote 3 of MR, CME removed 5585 ICS from CPA 9558-0001 during the monitoring period. However, number of ICS considered during this monitoring period for CPA 9558-0001 has been increased during this monitoring period. CME to clarify the reason for increase in number of ICS in CPA 9558-0001 compared to the reduced number of ICS considered during last periodic verification.				
Project participant response				Date : 28/06/2018
5585 ICS were removed from the database during last verification. Therefore footnote 3 is not valid for this monitoring period, hence deleted in the revised MR. CQC has included some new stoves in CPA 9558-0001 (5,414 ICS), 9558-0004 (16,207 ICS) and 9558-0005 (8,593 ICS). CQC has checked that in each CPA, threshold limit of energy saving (i.e. 180 GWH _{th}) will not exceed due to inclusion of these ICS.				
Documentation provided by project participant				
Revised MR version 02 dated 28/06/2018				
DOE assessment				Date: 05/07/2018
CME as a response, have clarified that there has been addition of 5,414 new ICS in CPA 9558-0001 during the current monitoring period. There has been no re-installation of removed ICS happened during this monitoring period. The footnote has been removed from revised MR and verification team found that none of the CPA is exceeding the threshold limit of energy saving (i.e. 180 GWH _{th}). Therefore, this CL is closed.				

CL ID	04	Section no.	E.1.3	Date : 19/07/2018
Description of CL				
As per paragraph 334 of VVS-PoA version 1.0 , “the DOE shall confirm that CPAs have been included in requests for issuance of CERs in a consecutive manner, that is, when a CPA has been included in a request for issuance of CERs for a monitoring period, the DOE shall confirm that a request for issuance of CERs for the previous monitoring period that included the particular CPA has been published”.				
CME to clarify , why the MR for the previous monitoring period of CPA 9558-0005 (that is between 07/10/2016 to 15/04/2017) has not been published?				
Project participant response				Date : 23/07/2018
Start date of crediting period for this CPA has now been revised to 16/04/2017 on UNFCCC website.				
Documentation provided by project participant				
UNFCCC webpage for CPA 9558-0005				
DOE assessment				Date: 23/07/2018
CME as a response, have revised the crediting period start date for CPA 9558-0005 on UNFCCC webpage through direct communication with CDM EB in line with Paragraph 232 of CDM PS for PoA. Now the crediting period start date of CPA 9558-0005 is inline with the present monitoring period start date. Therefore, this CL is closed.				

CL ID	05	Section no.	E.3.4.3	Date : 04/09/2018
Description of CL				
As shown in the sheet “N _y and SS _y data” of the spreadsheet titled “9558 Sampling sheet”, out of 235 respondents, the number of respondents who answered “no” to question 2(c) was 1, while the number of respondents who answered “no” to question 2(d) was 3. Further, it is noted that “no” entries to question 2(c) and question 2(d) should not overlap.				
However, in the sheet “N _y and SS _y data”, one respondent (Kasimu Saka) of ROW197 answered “no” to the question 2(c) but answered “yes” to the question 2(d).				
The CME is requested to clarify how can an ICS stove , which is not in operation, could be considered as operational in N _y calculation specially in the case of respondent (Kasimu Saka).				
Project participant response				Date : 04/09/2018

Referring the specific case (ROW 197) in the sheet “N_y and SS_y data” of the spreadsheet titled “9558 Sampling sheet”; in response of question 2(c) (Stove operational? Y=1; N=0), originally answer was 1 i.e. yes. This can be seen from the survey form filled during the survey. So, while making data entry, this was wrongly entered in the spreadsheet and was typed as 0 (i.e. no).

Question 2 (c) is to enquire whether the distributed ICS is operational at the time of survey, while question 2 (d) if to enquire if particular stove is being used for the cooking purpose or any other (for heating water etc.) Therefore CQC has adopted a conservative approach while considering the parameter $n_{y,i}$.

Field survey form filled at the time of survey is again submitted to DOE for further verification.

Documentation provided by project participant

Field survey form for Kasimu Saka (Stove ID TLC046252)
Revised 9558 Sampling Sheet dated 04/09/2018

DOE assessment **Date:** 06/09/2018

CME as a response, have shared the filled survey form for ICS ID TLC046252, which shows that ICS user using the stove at the time of survey for cooking purpose. Verification team (Local Expert) personally called and interviewed the ICS user (Kasimu Saka) and confirmed the same. The error occurred during manual data transfer from Survey forms to the 9558 Sampling Sheet and ICS was mentioned as non-operational in response to the question 2(c). CME has now corrected the same in revised 9558 Sampling sheet. CME has adopted a conservative approach by considering the ICS as non-operational, if the ICS user not using it for cooking purpose, despite of the fact that ICS is in working condition at the time of survey. This is considered a conservative approach and hence acceptable. Therefore, this CL is closed.

Table 3. CAR from this verification

CAR ID	02	Section no.	E.3.4.2	Date	: 21/06/2018
Description of CAR					
The values of monitored parameter SS_y , $n_{y,j}$ and $\eta_{new,y,i}$ are inconsistent between MR, ER spreadsheet and corresponding sampling survey results spreadsheet . Also, the value of ER achieved during this monitoring period is inconsistent between MR and ER spreadsheet.					
Project participant response					Date : 28/06/2018
Values of all the parameters e.g. SS_y , $n_{y,j}$, $\eta_{new,y,i}$ and ERs achieved during this monitoring period have now been corrected and made consistent with the survey data & ER calculation spreadsheet in the revised MR.					
Documentation provided by project participant					
Revised MR version 02 dated 28/06/2018					
DOE assessment					Date: 05/07/2018
CME as a response, have corrected the value of monitoring parameters SS_y , $n_{y,j}$ and $\eta_{new,y,i}$ in revised MR along with values of ER achieved in each CPA in line with the ER spreadsheet and Sampling survey spreadsheet. Verification team confirms that, the values of monitoring parameters and ER achieved as mentioned in revised MR is now consistent with ER spreadsheet and Sampling survey spreadsheet. Therefore, this CAR is closed.					

CAR ID	03	Section no.	E.3.4.4	Date	: 21/06/2018
Description of CAR					
Under section G.2 of MR, the provided details of calibration of the monitoring equipment's used for determination of value of parameter $\eta_{new,y,i}$ are inconsistent with calibration certificates provided to the DOE. CME to substantiate the same.					
Project participant response					Date : 28/06/2018
Calibration dates of the monitoring equipment used in the WBT tests have been corrected and made consistent with the calibration certificates in the revised monitoring report. All the equipment's were calibrated and found well within prescribed range before their use. Calibration certificates of the equipment have been provided to DOE for verification.					
Documentation provided by project participant					
Revised MR version 02 Certificate of calibration issued by third party inspection agency					
DOE assessment					Date: 05/07/2018

CME as a response have clarified that thermometers have only been used during the WBT test to be conducted for determination of parameter $\eta_{new,y,l}$ once in a year. The last monitoring WBT test have been conducted between 21/03/2018 to 05/04/2018. CME has calibrated the thermometers on 17/11/2017 (before the due date of 01/02/2018), well before conducting the monitoring WBT tests. Verification team checked the calibration certificates issued by "Metrology Services Department, Malawi Bureau of Standards" and confirms that calibration of the thermometers has been conducted on 17/11/2017 and all thermometers have been found working within the specified error limits. Thus, the thermometers are considered worthy of use during the last monitoring WBT test conducted between 21/03/2018 to 05/04/2018. Therefore, this CAR is closed.

CAR ID	06	Section no.	E.2.1	Date : 04/09/2018
Description of CAR				
The values/date mentioned for “Total ICS working (till 15/04/2018)” and “Date of last ICS registered in the database” for CPA 8060-0001, CPA 8060-0004 and CPA 8060-0005 in the table titled “Installation and Registration of ICS” (page 7 of Monitoring Report) is inconsistent with the corresponding ER calculation sheet, and other parts of Monitoring Report. CME to substantiate the same.				
Project participant response				Date : 04/09/2018
The dates of last registered ICS and numbers of the total ICS working till 15/04/2018 mentioned for each CPA on page number 7 of the MR have been corrected and made consistent with the database and ER calculation sheet.				
Documentation provided by project participant				
Revised MR version 02.2				
DOE assessment				Date: 06/09/2018
CME as a response, have corrected the value of “Total ICS working (till 15/04/2018)” and “Date of last ICS registered in the database” on page 7 of revised MR for CPA 9558-0001, 9558-0004 and 9558-0005 in line with the ER spreadsheet. Verification team confirms that, the values as mentioned in revised MR is now consistent with ER spreadsheet and respective CPA database. Therefore, this CAR is closed.				

Table 4. FAR from this verification

There is no FAR from this verification.

FAR ID	xx	Section No.		Date: DD/MM/YYYY
Description of FAR				
Project participant response				Date: DD/MM/YYYY
Documentation provided by project participant				
DOE assessment				Date: DD/MM/YYYY

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Document information

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