




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

Complete this form in accordance with the "Attachment. Instructions for filling out the verification and certification report form for CDM programme of activities" at the end of this form.

VERIFICATION AND CERTIFICATION REPORT

Title of the programme of activities (PoA)	Paradigm Sub Saharan Africa Cook Stove Programme	
UNFCCC reference number of the PoA	9672	
Version number(s) of the PoA-DD(s) applicable to this report	Version 10	
Version number of the verification and certification report	4	
Completion date of the verification and certification report	08/05/2017	
Monitoring period number	1	
Duration of this monitoring period	01/09/2013 – 31/12/2016 ¹	
Number and version number of the monitoring report to which this report applies	Number: 1; Version number: 5	
Coordinating/managing entity (CME)	The Paradigm Project	
Host Party(ies)	Host Party(ies) of the PoA	Is this a host Party to a CPA covered in this report?(yes/no)
	Rwanda	No
	Ethiopia	Yes
Sectoral scope(s)	3: Energy Demand	
Selected methodology(ies)	AMS-II.G: "Energy Efficiency Measures in Thermal Applications of Non-Renewable Biomass" (Version 05.0)	
Selected standardized baseline(s)	NA	
Total estimated GHG emission reductions or net GHG removals for this monitoring period in the included CPA(s) covered in this report	122,585	
Total certified GHG emission reductions or net GHG removals for this monitoring period for the included CPA(s) covered	2,512	

¹ The monitoring period is inclusive of both the dates.

in this report	
Name of DOE	Carbon Check (India) Private Ltd.
Name, position and signature of the approver of the verification and certification report	Vikash Kumar Singh, Compliance Officer 

SECTION A. Executive summary

>>

Purpose, general description and location of the project activity:

The co-ordinating managing entity/project participant (The Paradigm Project) has appointed the DOE, Carbon Check (India) Private Ltd. to perform an independent first (1st) periodic verification of the CDM Programme of Activity “Paradigm Sub Saharan Africa Cook Stove Programme” in Ethiopia and Rwanda (hereafter referred to as “Programme of Activity” or “PoA”) for the CPA(s) titled “Paradigm Cook Stove Programme: Ethiopia 01 (TPP-CPA-01-ETH)”. The only other included CPA in the PoA “Paradigm Cook Stove Programme: Rwanda 01 (TPP-CPA-01-RWN)” has not been reported in this monitoring report. The PoA involves dissemination of improved cooking stoves to household users in Ethiopia. The PoA saves greenhouse gas emissions by replacing inefficient baseline (traditional/three-stone) stoves with improved cookstoves. The aim of the PoA is to abate greenhouse gas (GHG) emissions and reduce non-renewable biomass consumption used for thermal energy needs by introducing improved, higher efficiency cook stoves to replace traditional inefficient and low efficiency cook stoves. The CPAs are designed to generate emission reductions by distribution of energy efficient or improved stoves for household cooking purposes in Ethiopia.

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

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

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

The objective of this verification was to verify and certify emission reductions reported for the Programme of activities “Paradigm Sub Saharan Africa Cook Stove Programme” in the host country “Ethiopia” for the period 01/09/2013 to 31/12/2016 (including both the days).

The purpose of verification is to review the monitoring results and verify that the monitoring methodology was implemented according to the monitoring plan and monitoring data, and used to confirm the reductions in anthropogenic emissions by sources, is sufficient, definitive and presented in a concise and transparent manner. Carbon Check’s objective is to perform a thorough, independent assessment of the registered project activity.

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

Scope of the verification:

The scope of the verification is:

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

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

Verification process:

The verification comprises a review of the monitoring report over the monitoring period from 01/09/2013 to 31/12/2016 (including both the days) and based on the registered/approved revised PoA-DD/CPA-DD in part of the monitoring parameters and monitoring plan, emission reduction calculation spreadsheet, monitoring methodology and all related evidence provided by project participant/CME.

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

Conclusion:

The verification team assigned by the DOE concludes that the PoA-DD (Version 10, dated 27/10/2015), CPA-DD (CPA 1 - Version 8, 26/06/2013) /B04/ and monitoring report (version 5.0, dated 08/05/2017) /02/, meets all the relevant requirements of the UNFCCC for CDM project activities/ programme of activities including article 12 of the Kyoto Protocol and paragraph 62 of CDM M& P, the modalities and procedures for CDM (Marrakesh Accords) and the subsequent decisions by the COP/MOP and CDM Executive Board. The verification has been conducted in-line with the requirements of VVS (version 09.0) /B01-1/.

The programme of activity was correctly implemented according to the selected monitoring methodology, monitoring plan and the registered/approved revised PoA-DD. The monitoring system was installed, maintained in a proper manner, while collected monitoring data allowed for the verification of the amount of achieved GHG emission reductions. Through the review and on site visit the verification team confirms that the project activity has resulted in the 2,512 tCO₂e emission reductions during the first monitoring period.

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

SECTION B. Verification team, technical reviewer and approver**B.1. Verification team members**

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)	Involvement in			
						Desk review	On-site inspection	Interview(s)	Verification findings
1.	Team Leader/ Technical Expert	IR	Dimri	Anubhav	CC IPL	X	X	X	X
2.	Local Expert	EI	Abewaw	Samuel	CC IPL	X			

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

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)
1.	Technical reviewer	IR	Anand	Amit	CC IPL
2.	Approver	IR	Singh	Vikash Kumar	CC IPL

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

>>

The verification was performed primarily based on the review of the monitoring report /02/ and the supporting documentation. This process included review of data and information presented to verify their completeness and review of the monitoring plan and monitoring methodology. Documents reviewed or referenced during the verification are listed in Appendix 3 below.

C.2. On-site inspection

Duration of on-site inspection: 03/04/2017 to 05/04/2017				
No.	Activity performed on-site	Site location	Date	Team member
1.	An assessment of the implementation and operation of the registered project activity as per the registered PoA-DD, registered/included CPA-DD.	Ethiopia	03/04/2017 to 05/04/2017	Anubhav Dimri Samuel Abebaw
2.	A review of information flows for generating, aggregating and reporting the monitoring parameters	Ethiopia	03/04/2017 to 05/04/2017	Anubhav Dimri Samuel Abebaw
3.	Interviews with relevant personnel to determine whether the operational and data collection procedures are implemented in accordance with the monitoring plan in the CPA-DD	Ethiopia	03/04/2017 to 05/04/2017	Anubhav Dimri
4.	A cross check between information provided in the monitoring report and data from other sources such as plant logbooks, inventories, purchase records or similar data sources	Ethiopia	03/04/2017 to 05/04/2017	Anubhav Dimri Samuel Abebaw
5.	A check of the monitoring equipment including calibration performance and observations of monitoring practices against the requirements of the CPA-DD and the selected methodology and corresponding tool(s), where applicable	Ethiopia	03/04/2017 to 05/04/2017	Anubhav Dimri Samuel Abebaw
6.	A review of calculations and assumptions made in determining the GHG data and emission reductions	Ethiopia	03/04/2017 to 05/04/2017	Anubhav Dimri Samuel Abebaw
7.	An identification of quality control and quality assurance procedures in place to prevent or identify and correct any errors or omissions in the reported monitoring parameters	Ethiopia	03/04/2017 to 05/04/2017	Anubhav Dimri Samuel Abebaw

C.3. Interviews

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1.	Spencer	Gregory	Paradigm East Africa Manufacturing PLC	05/04/2017	Project implementation and operation, monitoring procedure, data and information flow, Survey records, Sales/Distribution records	Anubhav Dimri
2.	Matocha Barber	Johanna	Evaluent (Freelancer)	03/04/2017 to 05/04/2017	Sampling Plan, Survey records, Sales/Distribution records, CER waiver records and procedure, QA/QC Procedures, Quality Assurance – Management and operating system	Anubhav Dimri
3.	Equbay	Zeray	Paradigm East Africa Manufacturing PLC	03/04/2017 to 05/04/2017	CER calculation and completeness of monitoring report, Electronic Monitoring system, Sampling Plan, Survey records, Sales/Distribution records, CER waiver records and procedure, QA/QC Procedures, Quality Assurance – Management and operating system	Anubhav Dimri

C.4. Sampling approach

>>

The sampling plan implemented by the CME is in accordance with the applied approved monitoring methodology /B02/ and the approved revised PoA-DD/CPA-DD /B04/. The PP has appropriately performed Stratified Random Sampling in accordance with the applied methodology/B02/ and the monitoring plan provided in the PoA-DD/B04/ and the CPA-DD/B04/. Only one stratum is applicable in the reported monitoring period as the reported period includes single country within one CPA and single technology (type of stove), thus only one strata is acceptable to the verification team. CL 04 had been raised in this regard and has been resolved.

The well-trained personnel of the CME (The Paradigm Project) have carried out the sampling survey and training certificate of the personnel has been provided to the verification team/08/.

Monitoring parameters n_y and SM_y are monitored through monitoring surveys and an application was used on Android phone to record the responses. Monitoring parameter $\eta_{new,y}$ is monitored through conducting the water boiling tests to determine the efficiency of the installed stoves. Monitoring of the parameter ensures compliance to the para 23 (b) of the methodology AMS-II.G (version 05.0)/B02/. Verification team has checked the water boiling test records/14/ to confirm the test results. The total energy savings by the project technology has also been determined in the section D.1 of the MR/02/ and the ER sheet/04/ and is within the small scale limit of 180 GWh_{th} thus complying with the para 4 of the methodology AMS-II.G, version 05/B02/. Parameter n_y monitors the total operating fraction of the stoves in the monitoring period. The monitoring of the parameter n_y ensures the compliance to the requirements to the para 22 of the monitoring methodology, AMS-II.G (version 05.0). Parameter SM_y monitors the fraction of project stove usage where baseline stoves continue to be used. The parameter records the value as the number of meals cooked on project stove divided by the total number of meals cooked in a week/04/. The monitoring of the parameter SM_y ensures the compliance to the requirements of the para 26(b) of the monitoring methodology, AMS-II.G (version 05.0)/B02/.

CME has done a sampling for the PoA and the only CPA reported in the monitoring period, CPA 1 for the current monitoring period. As no previous monitoring has been done in the PoA, the variance values for the calculation of sample sizes are based on a similar gold standard project being implemented by the project proponent in Kenya (GS reference number 966). PP has clarified in the sampling calculator that the variance values for the calculation of sample sizes are based on a similar gold standard project being implemented by the project proponent in Kenya. To be conservative, the PP further used 'best guess' conservative values to estimate the values for the variance. This is acceptable to the verification team since the estimates are based on result of previous studies and "best guesses" based on the researcher's own experiences. This is in accordance with the para 5 (a) and (c) of the Appendix 1 of the Sampling Guidelines version 4.0 (EB 86 Annex 4)/B08/. A sample size of 19 was determined for the parameter n_y based on the required confidence interval/precision level of 95/10, this sample size was increased to 30 in order to meet the requirements of the sampling standard/B07/. The sample size determined for the parameter SM_y based on the required confidence interval/precision level of 95/10 is 61. However, to account for the non-responses CME used a sample of 112 out of which 83 valid responses were obtained for the parameter n_y and 65 valid responses were obtained for the parameter SM_y . The valid responses received by the CME are more than the minimum required sample sizes and thus acceptable to the verification team. The precision achieved for the parameter n_y is 8.92% and thus within the limits of 10% required precision for the parameter. The precision achieved for the parameter SM_y is 6.61% and thus within the limits of 10% required precision for the parameter. A sample size of 19 was determined for the parameter $\eta_{new,y}$ based on the required confidence interval/precision level of 95/10. A sample of 41 was thus chosen to account for the non-responses and 24 valid responses were obtained. The valid responses were more than the required minimum sample size of 19 and thus the sampling results are acceptable to the verification team. The precision achieved for the parameter $\eta_{new,y}$ is 2.06 % and thus within the limits of 10% required precision for the parameter.

The precision level achieved for each of the parameters is less than the required precision of 10 and thus it is acceptable to the verification team. The precision level meets the desired precision level and is within the limits. This complies with the requirements of the §24 of the Standard: Sampling and surveys for CDM project activities and programmes of activities (version 05.0)/B07/.

The resultant applied sample size by the CME for the CPA1/02/ are summarized below:

Parameters	n_y	SM_y	$\eta_{new,y}$
Calculated Sample Size	19	61	19
Estimated Sample Size	30 (required minimum sample size)	61	19

Applied Sample Size (to account for non-responses)	112	112	41
Valid Responses	83	65	24
Precision achieved	8.92 %	6.61 %	2.06 %

DOE used sampling during verification for checking the operational status and the proportion of meals cooked on the project cookstoves. As per the sampling standard /B07/, DOE had identified 8 samples out of the PP's 65 samples for the parameter SM_y and 83 samples for the parameter n_y based on the AQL/UQL stated below. A sample size of 8 was required, based on an AQL of 0.5 % and UQL of 20 %, the producer risk used is 5 % and consumer risk used was 20 %. Acceptance number (c) thus determined for the sample is 0. A sample of 8 is justified since the PoA is located in least developed country and meets the requirement of para 31 (c) of the Sampling Standard version 05/B07/. All the identified 8 samples were operational and hence no discrepancy was found (i.e. $c=0$). The number of meals cooked on the project stoves and on the baseline stoves was also interviewed and the results were same as the responses received during the monitoring and hence no discrepancy was found (i.e. $c=0$). A sample size of 8 households was chosen (no non-responses observed). It was observed that all the cook stoves were in working condition and thus $c=0$, i.e. no discrepant records were observed with the MR /02/ and the ER sheet /04/. It was observed that the responses on the usage of project stoves and baseline stoves was same as observed at the time of monitoring and thus $c=0$, i.e. no discrepant records were observed with the MR /02/ and the ER sheet /04/. Thus PP's set of records has been accepted in line with § 30 of the sampling standard, version 05/B07/.

DOE checked the water boiling test report/10/ with records of all the sampled stoves for the verification of the stove efficiency of the project stoves. No sampling was required for the verification of the tests of the efficiency conducted.

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

Areas of verification findings	No. of CL	No. of CAR	No. of FAR
General			
Compliance of the monitoring report with the monitoring report form	01	01	00
Remaining forward action requests from validation and/or previous verification	00	00	00
Specific-case CPA(s) considered for verification and covered in this report	00	00	00
Programme of activities			
Compliance of the programme implementation with the registered PoA-DD	00	00	00
Implementation and operation of the management system	01	00	00
Post-registration changes	00	00	00
<ul style="list-style-type: none"> Temporary deviations from the registered monitoring plan, monitoring methodology or standardized baseline 	00	00	00
<ul style="list-style-type: none"> Corrections 	00	00	00
<ul style="list-style-type: none"> Inclusion of a monitoring plan in a registered PoA-DD (including its generic CPA-DD(s)) 	00	00	00
<ul style="list-style-type: none"> Permanent changes to the monitoring plan as described in the registered PoA-DD, applied methodology, or applied standardized baseline 	00	00	00
<ul style="list-style-type: none"> Changes to the programme design of the registered PoA-DD (including corresponding changes to project design of the generic CPA-DD(s)) and updates to the eligibility criteria for inclusion of specific-case CPAs in the PoA 	00	00	00
<ul style="list-style-type: none"> Types of changes specific to afforestation and reforestation activities 	00	00	00

Component project activity(ies)			
Compliance of the CPA implementation with the included CPA design document	01	00	00
Post-registration changes	00	00	00
<ul style="list-style-type: none"> Temporary deviations from registered monitoring plan, applied methodology or applied standardized baseline 	00	00	00
<ul style="list-style-type: none"> Corrections 	00	00	00
<ul style="list-style-type: none"> Changes to the start date of the crediting period 	00	00	00
<ul style="list-style-type: none"> Inclusion of a monitoring plan to an included CPA-DD 	00	00	00
<ul style="list-style-type: none"> Permanent changes to the monitoring plan as described in the included CPA-DD, applied methodology, or applied standardized baseline 	00	00	00
<ul style="list-style-type: none"> Changes to the programme design of the included CPA-DD 	00	00	00
<ul style="list-style-type: none"> Types of changes specific to afforestation and reforestation component project activities 	00	00	00
Compliance of the monitoring plan with the monitoring methodology including applicable tool and standardized baseline	02	01	00
Compliance of monitoring activities with the registered monitoring plan	00	00	00
<ul style="list-style-type: none"> Data and parameters fixed ex ante or at renewal of crediting period 	00	00	00
<ul style="list-style-type: none"> Data and parameters monitored 	01	01	00
<ul style="list-style-type: none"> Implementation of sampling plan 	00	00	00
Compliance with the calibration frequency requirements for measuring instruments	00	00	00
Assessment of data and calculation of emission reductions or net removals			
<ul style="list-style-type: none"> Calculation of baseline GHG emissions or baseline net GHG removals by sinks 	01	00	00
<ul style="list-style-type: none"> Calculation of project GHG emissions or actual net GHG removals by sinks 	00	00	00
<ul style="list-style-type: none"> Calculation of leakage GHG emissions 	00	00	00
<ul style="list-style-type: none"> Summary of calculation of GHG emission reductions or net GHG removals by sinks 	00	00	00
<ul style="list-style-type: none"> Comparison of actual GHG emission reductions or net GHG removals by sinks with estimates in included specific-case CPA 	01	00	00
<ul style="list-style-type: none"> Remarks on difference from estimated value in registered PDD 	00	00	00
Others (please specify)	00	00	00
Total	08	03	00

SECTION D. Internal quality control

>>

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

SECTION E. Verification opinion

>>

Carbon Check (India) Private Ltd. has performed the first periodic verification of the registered CDM Programme of Activities "Paradigm Sub Saharan Africa Cook Stove Programme" (UNFCCC reference number 9672) for the CPA titled "Paradigm Cook Stove Programme: Ethiopia 01 (TPP-CPA-01-ETH)" with UNFCCC reference numbers 9672-0001 and "Paradigm Cook Stove Programme: Rwanda 01 (TPP-CPA-01-RWN)" with 9672-0002 has not been reported in the

monitoring report. The verification team assigned by the DOE concludes that the Component Project Activity/ies as described in the registered/included CPA-DDs (CPA 1 - Version 8, 26/06/2013) and monitoring report (version 05, dated 08/05/2017)/02/, meets all the relevant requirements of the UNFCCC for CDM project activities including article 12 of the Kyoto Protocol and paragraph 62 of CDM M & P, the modalities and procedures for CDM (Marrakesh Accords) and the subsequent decisions by the COP/MOP and CDM Executive Board. The verification has been conducted in-line with the requirements of VVS (version 09.0) /B01-1/.

Verification methodology and process

The Verification team confirms the contractual relationship signed on 16/01/2017 between the DOE, Carbon Check (India) Private Ltd. and the Co-ordinating Managing Entity/ Project Participant, (The Paradigm Project). The team assigned to the verification meets the Carbon Check (India) Private Ltd.'s internal procedures including the UNFCCC requirements for the team composition and competence. The verification team has conducted a thorough contract review as per UNFCCC and Carbon Check procedures and requirements.

The verification has been performed as per the requirements described in the VVS (version 09.0) and constitutes the review and completion of the following steps:

- Reviewing the revised and approved PoA-DD (Version 10; dated 27/10/2015), registered/included CPA DDs (CPA 1 - Version 8; dated 26/06/2013), including the monitoring plan and the corresponding validation report/s;
- Publication of the MR on the UNFCCC website (version 01; dated 31/12/2016) (submitted to UNFCCC for publication on 31/01/2017)
- Desk review of the validation report, MR and other relevant documents including documents related to the projects activities in emission reductions
- Review of the applied monitoring methodology (AMS-II.G, version 05.0);
- Review of any CMP and EB decisions, clarifications and guidance;
- On-site assessment (03/04/2017 – 05/04/2017)
- Resolution of CARs and CLs raised during verification
- Issuance of Verification Report

The component project activities were correctly implemented according to the selected monitoring methodology (ies), monitoring plan and the registered/included CPA-DDs. The monitoring system was installed, maintained in a proper manner, while collected monitoring data allowed for the verification of the amount of achieved GHG emission reductions. Through the review and on site visit the verification team confirms that the PoA has resulted in the 2,512 tCO₂e emission reductions during the third monitoring period.

During the reported monitoring period two CPAs were registered. However, out of the 2 included CPAs only one (TPP-CPA-01-ETH)" with UNFCC reference numbers 9672-0001 was eligible to claim emission reductions. The emission reductions have been reported for 1 out of 2 CPAs in the monitoring report. The emission reductions have been claimed only for CPA 1 (UN reference number: 9672-0001):

Verified emission reductions (CPA 1): 2,512 tCO₂e

The break-up of emission reduction from 01/09/2013 to 31/12/2016 as verified during the course of verification are as below:

Item	Emission reductions up to 31 December 2012	Emission reductions from 1 January 2013 onwards
Emission reductions (t CO₂e)	0	2,512

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

SECTION F. Certification statement

>>

Carbon Check (India) Private Ltd, the DOE, has performed the first (1st) periodic verification of the registered Programme of Activities “UNFCCC Registration Number 9672”, “Paradigm Sub Saharan Africa Cook Stove Programme” in Ethiopia and Rwanda. The aim of the PoA is to abate greenhouse gas (GHG) emissions and reduce non-renewable biomass consumption used for thermal energy needs by introducing improved, higher efficiency cook stoves to replace traditional inefficient and low efficiency cook stoves. The component project activities of the Programme of Activity are designed to generate emission reductions by distribution of the fuel-efficient cook stoves in Ethiopia and Rwanda. The fuel-efficient cook stoves are replacing the baseline biomass based stoves in common use (baseline scenario).

The CME and the CPA implementer are responsible for the collection of data in accordance with the monitoring plan and the reporting of GHG emissions reductions from the component project activity/ies. It is DOE's responsibility to express an independent verification statement on the reported GHG emission reductions from the component projects. The DOE does not express any opinion on the selected baseline scenario or on the validated and registered PoA-DD/CPA-DD. The verification is carried out in-line with the VVS requirements.

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

The verification is based on:

- Revised and approved PoA-DD (version 10; dated 27/10/2015),
- CPA DD/s included in the registered PoA and its monitoring plan.
- Approved monitoring methodology AMS-II.G “Energy efficiency measures in thermal applications of non-renewable biomass”, version 05;
- Validation report /B04/ for the PoA and CPA/s;
- Monitoring report(s) version(s) 01, 02, 03, 04 and 05, dated 31/12/2016, 18/04/2017 and 25/04/2017, 30/04/2017 and 08/05/2017 respectively).

This statement covers verification period of 1218 days between 01/09/2013 and 31/12/2016.

The DOE had raised 08 clarification and 03 corrective action requests, all of which have been successfully resolved by PP (s). No Forward action request has been raised during this verification.

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

The DOE, hereby certifies that the project activity, achieved emission reductions by sources of GHG equal to 2,512 tCO₂e and all monitoring requirements have been fulfilled and is substantiated by an audit trail that contains evidence and records. The break-up of emission reduction from 01/09/2013 to 31/12/2016 as verified during the course of verification is as below:

Item	Emission reductions up to 31 December 2012	Emission reductions from 1 January 2013 onwards
Emission reductions (t CO ₂ e)	0	2,512

SECTION G. Verification findings - General**G.1. Compliance of the monitoring report with the monitoring report form**

Means of verification	DR, I
Findings	CL 01 and CAR 01 had been raised in this regard. Please refer to Appendix 4 below for further details of the CAR & CL.
Conclusion	The monitoring report provides all the information in accordance with the valid version of the CDM-PoA-MR-FORM (version 01) and the instructions therein for filling the CDM-PoA-MR-FORM. All the clarification requests and the corrective action requests on this section of the verification report have been resolved. The monitoring report has been prepared in accordance with the § 381 and § 382 of the VVS (version 09.0) /B01-1/.

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

>>

There are no forward action requests from validation and/or the previous verification of the project activity.

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

Reference number of the specific-case CPA included in the PoA as of the end of this monitoring period	Is the specific-case CPA considered for this verification? (yes/no)	Version number of the registered PoA-DD to which the specific-case CPA complies with	Confirmation that a request for issuance including the specific-case CPA has been published for the previous monitoring period (Y/N)
9672-0001	Yes	Version 10	N
9672-0002	No	Version 10	N

SECTION H. Verification findings – Programme of activities**H.1. Compliance of the programme implementation with the registered programme design document**

Means of verification	DR, I
Findings	There are no findings on this section of the VR.
Conclusion	As part of the site visit, the verification team was able to confirm that the implementation of Programme of Activity (PoA) and the Component Project Activity (CPA) is in accordance with the project description contained in the registered/revised and approved PoA-DD/B04/. The verification took cognizance of § 244 and 245 of the CDM Project Standard (version 09.0) /B01-2/ and § 383 (a) and § 384 of VVS (version 09.0) /B01-1/.

H.2. Implementation and operation of the management system

Means of verification	Document Review, Interview
Findings	CL 02 had been raised in this regard. Please refer to Appendix 4 below for further details of the CL.
Conclusion	The management system for the PoA including the record-keeping system has been explained in section C of the revised and approved PoA-DD /B04/. During the course of verification, verification team based on review of provided documents and OSV interview/observation has assessed this management system. This included the organisational chart, roles and responsibilities, data collection, transfer and aggregation procedures, training and capacity development for personnel /08/, Procedures for technical review of inclusion of CPAs, procedure to avoid double counting, Records and documentation control process and Measures for continuous improvements of the PoA management system. On the basis of onsite interview

with the personnel of the CME involved in the project monitoring and data collection, inspection of monitoring database & equipment used and document review verification team can confirm that the responsibilities and authorities for monitoring and reporting are appropriate and effective for the project type and hence in accordance with the monitoring plan of the revised and approved PoA-DD/B04/ and the applied monitoring methodology/B02/.

Recipient household of ICS have ceded the rights of all entitlement of CERs to the managing entity of the PoA, this has been cross-verified from the signed sales agreements /13-1//12-1/ with the end users and signed agreements with the suppliers/13-2//12-2/. Sample sales agreements were also checked during the onsite visit /13/. Operation of the ICSs in the CPA 1 was confirmed during the site visit by the verification team. CPA 2 has not been implemented yet and has not been reported in the monitoring report/02/. Following was confirmed during the site visit:

1. Stoves numbering system
2. Electronic monitoring system including input procedure (through Android phone based ODK)
3. Actual implementation of the stoves
4. Household-representatives were interviewed regarding the usage of stove
5. Whether or not baseline technology was still in use
6. Process of data collection during installation of stove
7. Sales Agreements between households and CPA implementer

Carbon Check's verification team confirms that the CPAs are implemented within the boundary of the PoA as described in the revised and approved PoA-DD /B04/ and the implementation and operation of the project activity has been conducted in accordance with the description contained in the revised and approved PoA-DD /B04/ and registered/included CPA-DDs /B04/.

In accordance with § 385 c) of VVS (version 09.0) /B01-1/, information (data and variables) provided in the monitoring report that are different from that stated in the registered CPA-DDs /B04/ were assessed. The assessment is summarized below:

Parameter	Ex-ante value in the CPA-DD	Actual operation for the reported monitoring period	Assessment by the verification team
Number of distributed ICS in year y (S_y)	19,804	5,187	The numbers of distributed ICS in the CPA are lower than the ex-ante estimation due to the delays in early work and slower sales than estimated in the host country Ethiopia. The actual sales records/05/ have been checked by the verification team and the values reported are correct.
Fraction of distributed ICS operational in year y (n_y)	100% in year 1 and 90% for the remainder of the crediting period.	0.78	The fraction of distributed ICS operational in the CPA is lower than the estimated ex-ante value in the CPA-DDs/B04/. Based on the interview with the CME it was observed that some of the non-operational stoves were due to the stoves not having been used at all. Such households were

				<p>trained during the monitoring and thus started using stoves. However, during the monitoring period such stoves that were not being used at the time of monitoring have been not taken as operational stoves and thus higher dropout rate.</p> <p>This is deemed acceptable, as it does not lead to increase of emission reductions and is appropriate at the time of monitoring.</p>
	Cumulative number of days which ICSs have been operational in year y (D_y)	365 days	937,039 days	<p>The cumulative number of days for which ICSs have been operational has been calculated by the number of days in total for each stove distributed in the CPA. The value of 365 was assumed for each stove at the time of registration, however as the stoves were distributed on different dates, the cumulative takes into account only the number of days after the distribution of the stove.</p> <p>This is deemed acceptable, as it does not lead to increase of emission reductions.</p>
	Fraction of meals in a week cooked on the project stove in year y (SM_y)	1	0.51	<p>Fraction of meals in a week cooked on the project stove monitored ex-post for the current monitoring period is lower than the estimated ex-ante value in the CPA-DDs/B04/. CME has confirmed during the OSV that it is due to the technology being new to the households and that households are slowly changing from the baseline stoves to the project stoves.</p> <p>This is deemed acceptable, as it does not lead to increase of emission reductions.</p>
	Efficiency of the device being deployed as part of the project activity in year y	0.28	0.3079	<p>The average efficiency of the device being deployed ($\eta_{new,y}$) monitored ex-post for the current monitoring period is higher than the</p>

	$(\eta_{\text{new},y})$			<p>estimated ex-ante value in the CPA-DDs. CAR 03 was raised in this regard and has been resolved. CME has clarified that the difference in the efficiency determined during the monitoring is due to the following factors:</p> <ol style="list-style-type: none"> 1. Higher number of stoves used during the monitoring as compared to ex-ante calculations and thus more variation in the values of monitored efficiency. 2. The impact of local factors like temperature, altitude, moisture content in the air and wood used during testing. 3. The pot type used during monitoring was with rounded bottom compared to a flat pot at the time of ex-ante testing. 4. Material improvement from the manufacturer at the time of ex-ante testing to the actual stoves delivered. <p>Since, the difference in the determined efficiency during monitoring and the ex-ante value is of 2.9%, from the professional experience of the verification team and based on the reasons provided by the CME the value is acceptable. Also, since the project stoves are new with a low usage rate (SMY), the value of the efficiency is justified (as the stoves don't seem to be used much). The supporting documents for the calibration of the measurement equipment/06/ have been checked by the verification team to check consistency and found to be appropriate.</p> <p>This is also deemed acceptable to the verification team.</p>
--	-------------------------	--	--	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

	The verification team confirms that the monitoring management system of the CDM PoA is in place; with the responsibilities properly identified and in place. This confirms the compliance of § 83 (a), § 390 (b) (iv) and § 390 (e) of VVS (version 09.0)/B01-1/.
--	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

H.3. Post-registration changes

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

>>

CME has applied a temporary deviation from the registered monitoring plan/B04/ and in accordance with the para 272 of the Project Standard, version 09/B01/, the CME is temporarily unable to monitor the registered monitoring plan for the period 25/03/2015 to 31/12/2015 and thus opted for para 273 (a) of the project standard, version 09/B01/. In accordance with para 274 of the project standard, version 09/B01/, CME has applied conservative assumptions to the calculations of the emission reductions and thus in accordance with the para 2 of the Appendix 1 of the project standard, version 09/B01/, the baseline emission parameters have been taken as zero and thus no emission reductions have been claimed for the period 25/03/2015 to 31/12/2015. The equation (1) as provided in the para 11 of the methodology AMS-II.G, version 05/B02/ gives a value zero if the parameter $N_{y,i}$ is assumed to have a 100 % dropout rate (0 % operating fraction). The assumption is the conservative estimate and thus acceptable to the verification team. The temporary deviation as a post registration change is being submitted with the request for issuance for the monitoring period.

There are no other temporary deviations from the registered monitoring plan, monitoring methodology or standardized baseline applicable to the monitoring period that have been approved by the Board during this monitoring period or to be submitted with the request for issuance.

H.3.2. Corrections

>>

Post Registration Change to the PoA was approved on April 11, 2016 under reference number PRC-9672-002. The post registration change is prior to the submission of issuance request for the PoA.

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

>>

There are no inclusions of a monitoring plan in a registered PoA-DD applicable to the monitoring period that have been approved by the Board during this monitoring period or to be submitted with the request for issuance.

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

>>

Post Registration Change to the PoA was approved on April 11, 2016 under reference number PRC-9672-002. The post registration change is prior to the submission of issuance request for the PoA.

H.3.5. Changes to the programme design of the registered PoA-DD (including corresponding changes to project design of the generic CPA-DD(s)) and updates to the eligibility criteria for inclusion of specific-case CPAs in the PoA

>>

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

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

>>

Not applicable to the type of programme of activities.

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

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

Means of verification	Document Review, Interview																												
Findings	CL 03 had been raised in this regard. Please refer to Appendix 4 below for further details of the CL.																												
Conclusion	<p>The implementation status of the PoA and the component project activities is:</p> <table border="1"> <tr> <td>Co-ordinating and Managing entity/Project Participants:</td><td>The Paradigm Project</td></tr> <tr> <td>Title of the PoA:</td><td>Paradigm Sub Saharan Africa Cook Stove Programme</td></tr> <tr> <td>UNFCCC registration No:</td><td>9672</td></tr> <tr> <td>Applied Baseline and monitoring methodology:</td><td>AMS-II.G (version 5.0)/B02/</td></tr> </table> <table border="1"> <tr> <td>Title of the CPA:</td><td>Paradigm Cook Stove Programme: Ethiopia 01 (TPP-CPA-01-ETH)</td></tr> <tr> <td>CPA reference number:</td><td>9672-0001</td></tr> <tr> <td>Date of inclusion:</td><td>01/07/2013</td></tr> <tr> <td>CPA start date:</td><td>01/02/2013</td></tr> <tr> <td>CPA start of operation:</td><td>25/03/2015</td></tr> <tr> <td>CPA implementer</td><td>The Paradigm Project</td></tr> <tr> <td>Project Scale:</td><td>Small scale</td></tr> <tr> <td>Location of the CPAs:</td><td>Ethiopia</td></tr> <tr> <td>CPA crediting period:</td><td>01/09/ 2013 – 09/11/2021</td></tr> <tr> <td>Reported monitoring Period verified in this verification:</td><td>01/09/2013 to 31/12/2016</td></tr> </table> <p>There is only one CPA under Verification. The CPA involves the distribution of improved cooking stoves in the host country Ethiopia. The coordinating/managing entity for the PoA is The Paradigm Project. The ICS deployed under CPA 1 is EzyStove /12/. CPA 2 (9672-0002) has not been reported in the monitoring report. This is in accordance with the para 429 of the VVS (version 09.0)/B01-1/ and the CPA is not reported in this batch in the monitoring report. The numbers of stoves deployed under each CPA has been confirmed through the review of the sales database /05/. The verified /05/ total number of stoves deployed (implemented) under the CPA/PoA are 5,187.</p> <p>As per the registered CPA-DDs /B04/, the maximum number of ICS to be deployed per year to ensure the CPA remains under the threshold of 60 GWh (corresponding to 180 GWh thermal energy savings) was 19,804. However in actual with implementation of 5,187 stoves the total energy savings in the CPA during the monitoring period is equal to 24.5 GWh_{th} and 0.00957 GWh_{th} per device. Thus the total energy savings from the CPA is less than the small-scale threshold in the CPA-DD/B04/ and the methodology AMS-II.G (version 05.0)/B02/.</p> <p>The component project activity was implemented and equipment installed as described in the registered/included CPA DD/B04/. The implementation of the CPA</p>	Co-ordinating and Managing entity/Project Participants:	The Paradigm Project	Title of the PoA:	Paradigm Sub Saharan Africa Cook Stove Programme	UNFCCC registration No:	9672	Applied Baseline and monitoring methodology:	AMS-II.G (version 5.0)/B02/	Title of the CPA:	Paradigm Cook Stove Programme: Ethiopia 01 (TPP-CPA-01-ETH)	CPA reference number:	9672-0001	Date of inclusion:	01/07/2013	CPA start date:	01/02/2013	CPA start of operation:	25/03/2015	CPA implementer	The Paradigm Project	Project Scale:	Small scale	Location of the CPAs:	Ethiopia	CPA crediting period:	01/09/ 2013 – 09/11/2021	Reported monitoring Period verified in this verification:	01/09/2013 to 31/12/2016
Co-ordinating and Managing entity/Project Participants:	The Paradigm Project																												
Title of the PoA:	Paradigm Sub Saharan Africa Cook Stove Programme																												
UNFCCC registration No:	9672																												
Applied Baseline and monitoring methodology:	AMS-II.G (version 5.0)/B02/																												
Title of the CPA:	Paradigm Cook Stove Programme: Ethiopia 01 (TPP-CPA-01-ETH)																												
CPA reference number:	9672-0001																												
Date of inclusion:	01/07/2013																												
CPA start date:	01/02/2013																												
CPA start of operation:	25/03/2015																												
CPA implementer	The Paradigm Project																												
Project Scale:	Small scale																												
Location of the CPAs:	Ethiopia																												
CPA crediting period:	01/09/ 2013 – 09/11/2021																												
Reported monitoring Period verified in this verification:	01/09/2013 to 31/12/2016																												

was delayed and the first stove was distributed in the CPA on 25/03/2015 /02/. Prior to this distribution, the CME was distributing the stoves through a third party distributor. However, the partnership with the third party could not continue and the stoves prior to 25/03/2015 have not been added to the sales database of the CPA. CME has stated in the section D.1 of the monitoring report/02/ that CME chose to include only those units, which it sold directly and could account for completely in the sales database/05/. CME has clarified during the on-site visit that 2015 was the first year of stove sales and was a partial year with low sales volumes, so no monitoring was conducted. The PP conducted the first year of annual monitoring in 2016 and conservatively chose to claim no credits for the period from 25/03/2015 to 31/12/2015. Accordingly, a temporary deviation has been made by the CME to delay the annual monitoring until the first full year of implementation of the CPA (01/01/2016 to 31/12/2016). No distributions have been made in the CPA from the start date of the crediting period 01/09/2013 to 24/03/2015 and no ERs have been claimed for the period 25/03/2015 to 31/12/2015.

In accordance with the para 272 of the Project Standard, version 09/B01/, the CME is temporarily unable to monitor the registered monitoring plan and thus opted for para 273 (a) of the project standard, version 09/B01/. In accordance with para 274 of the project standard, version 09/B01/, CME has applied conservative assumptions to the calculations of the emission reductions and thus in accordance with the para 2 of the Appendix 1 of the project standard, version 09/B01/, the baseline emission parameters have been taken as zero and thus no emission reductions have been claimed for the period 25/03/2015 to 31/12/2015. The equation (1) as provided in the para 11 of the methodology AMS-II.G, version 05/B02/ gives a value zero if the parameter $N_{y,i}$ is assumed to have a 100 % dropout rate (0 % operating fraction). The assumption is the conservative estimate and thus acceptable to the verification team.

It was confirmed during the OSV that The Paradigm Project is the Coordinating/Managing Entity for the PoA and the CPA implementer for CPA 1 (9672-0001). The actual project activity is in line with the registered/included CPA-DDs /B04/.

The information (including data and variables) provided in the MR /02/ is in line with the details provided in the included/registered CPA-DD/B04/.

Verification Team summarizes *major* changes for the CPA/s between webhosted Monitoring Report and final version of Monitoring Report for submission as follows:

Subject	Webhosted Monitoring Report (MR) /01-1/	Verified Monitoring Report /02/
Changes		
CER calculations (amount of emission reduction)	2,619	2,512 The total emission reductions have reduced as the duplicate serial numbers observed in the ER sheet/04/ have been deleted and not accounted for the emission reductions.

Carbon Check's verification team considers the project description of the project contained in the revised and approved PoA-DD /B04/ and CPA-DD /B04/ to be complete and accurate. The CPA-DD complies with the relevant methodology/B02/, tools, forms and guidance at the time of CPA-DD submission for registration/inclusion.

Carbon Check's verification team considers the CPA description of the project contained in the registered CPA-DDs/04/ to be complete and accurate. The CPA-DDs complies with the relevant methodology, tools, forms and guidance at the time of CPA-DDs' submission for registration/inclusion. The CPA has been implemented

	in accordance with the registered CPA-DDs/04/.
--	------------------------------------------------

	In summary, the monitoring period is reasonable and the operation of the CPAs is in accordance with the registered CPA-DDs. The verification team took cognizance of § 239 to § 242 of CDM Project Standard (version 09.0) /B01-2/ and § 373 b (i), § 383, § 384 and § 385 of VVS (version 09.0) /B01-1/.
--	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

I.2. Post-registration changes

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

>>

CME has applied a temporary deviation from the registered monitoring plan/B04/ and in accordance with the para 272 of the Project Standard, version 09/B01/, the CME is temporarily unable to monitor the registered monitoring plan for the period 25/03/2015 to 31/12/2015 and thus opted for para 273 (a) of the project standard, version 09/B01/. In accordance with para 274 of the project standard, version 09/B01/, CME has applied conservative assumptions to the calculations of the emission reductions and thus in accordance with the para 2 of the Appendix 1 of the project standard, version 09/B01/, the baseline emission parameters have been taken as zero and thus no emission reductions have been claimed for the period 25/03/2015 to 31/12/2015. The equation (1) as provided in the para 11 of the methodology AMS-II.G, version 05/B02/ gives a value zero if the parameter $N_{y,i}$ is assumed to have a 100 % dropout rate (0 % operating fraction). The assumption is the conservative estimate and thus acceptable to the verification team. The temporary deviation as a post registration change is being submitted with the request for issuance for the monitoring period.

There are no other temporary deviations from the registered monitoring plan, monitoring methodology or standardized baseline applicable to the monitoring period that have been approved by the Board during this monitoring period or to be submitted with the request for issuance.

I.2.2. Corrections

>>

Post Registration Change to the PoA was approved on April 11, 2016 under reference number PRC-9672-002. The post registration change is prior to the submission of issuance request for the PoA and CPA.

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

>>

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

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

>>

There are no inclusions of a monitoring plan to an included CPA-DD applicable to the monitoring period that have been approved by the Board during this monitoring period or to be submitted with the request for issuance.

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

>>

Post Registration Change to the PoA was approved on April 11, 2016 under reference number PRC-9672-002. The post registration change is prior to the submission of issuance request for the PoA.

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

>>

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

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

>>

Not applicable to the type of component project activities.

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

Means of verification	Document Review, Interview
Findings	CL 04, CL 05 and CAR 02 had been raised in this regard. Please refer to Appendix 4 below for further details of the CAR & CL.
Conclusion	<p>The verification team is able to confirm that the monitoring plan contained in the registered CPA-DD/B04/ is in accordance with the approved methodology applied by the project activity, i.e. AMS-II.G (version 05.0) /B02/.</p> <p>The monitoring plan is in accordance with the approved methodology, AMS-II.G (version 05.0) /B02/, applied by the component project activity and as provided in the CPA-DD /B04/.</p> <p>The verification took cognizance of § 386 to § 388 of VVS (version 09.0) /B01-1/.</p>

I.4. Compliance of monitoring activities with the registered monitoring plan**I.4.1. Data and parameters fixed ex ante or at renewal of crediting period**

Means of verification	Document Review, Interview
Findings	There are no findings on this section of the VR.
Conclusion	<p>Verification team confirms that the Data and parameters fixed ex ante are in compliance with the registered CPA-DDs/B04/ and the monitoring plan. Please refer Appendix 5 for detailed analysis of the ex-ante parameters.</p> <p>The verification took cognizance of § 389 of VVS (version 09.) /B01-1/.</p>

I.4.2. Data and parameters monitored

Means of verification	Document Review, Interview
Findings	CL 06 and CAR 03 had been raised in this regard. Please refer to Appendix 4 below for further details of the CAR & CL.
Conclusion	<p>The verification team has assessed the data and parameters monitored during the monitoring period in accordance with para 247, 248 and 249 of the CDM Project Standard (version 09.0)/B01-2/. A complete assessment of each of the monitored parameters has been provided in Appendix 6 of the verification report. A complete assessment of the sampling approach has also been provided in section I.4.3 of the verification report.</p> <p>In summary, the verification team confirms that all the ex-ante and ex-post parameters are monitored in accordance with the approved monitoring plan and applied methodology. The verification took cognizance of § 247, 248 and 249 of the CDM Project Standard (version 09.0) /B01-2/ and § 401, 402 and 403 of the VVS (version 09.0) /B01-1/.</p>

I.4.3. Implementation of sampling plan

Means of verification	Document Review, Interview
Findings	CL 02 had been raised in this regard. Please refer to Appendix 4 below for further details of the CL.

Conclusion	<p>As mentioned in the above sections, CPAs 9672-0001 has been implemented for which emission reductions are being claimed for this monitoring period. The total population of the stoves under CPA 01 is 5,187 stoves the total number of stoves in the PoA is 5,187. The monitoring parameters required to be monitored through the sampling plan are:</p> <ol style="list-style-type: none"> 1. Fraction of distributed ICS operational in year y (n_y) 2. Fraction of meals in a week cooked on the project stove in year y (SM_y) 3. Efficiency of the device being deployed as part of the project activity in year y ($\eta_{new,y}$) <p>The sampling plan implemented by the CME is in accordance with the applied approved monitoring methodology /B02/ and the revised and approved PoA-DD/B04/ and registered/included CPA-DD/B04/. The PP has appropriately performed Stratified Random Sampling in accordance with the applied methodology/B02/ and the monitoring plan provided in the revised and approved PoA-DD/B04/ and the CPA-DD/B04/. Only one stratum is applicable in the reported monitoring period as the reported period includes single country within one CPA and single technology (type of stove), thus only one strata is acceptable to the verification team. CL 04 had been raised in this regard and has been resolved.</p> <p>The well-trained personnel of the CME, The Paradigm Project, have carried out the sampling survey and training certificate of the personnel has been provided to the verification team/08/.</p> <p>Monitoring parameters n_y and SM_y are monitored through monitoring surveys and an application was used on Android phone to record the responses. Monitoring parameter $\eta_{new,y}$ is monitored through conducting the water boiling tests to determine the efficiency of the installed stoves. Monitoring of the parameter ensures compliance to the para 23 (b) of the methodology AMS-II.G, version 05/B02/. Verification team has checked the water boiling test records/14/ to confirm the test results. The total energy savings by the project technology has also been determined in the section D.1 of the MR/02/ and the ER sheet/04/ and is within the small scale limit of 180 GWh_{th} thus complying with the para 4 of the methodology AMS-II.G, version 05/B02/. Parameter n_y monitors the total operating fraction of the stoves in the monitoring period. The monitoring of the parameter n_y ensures the compliance to the requirements to the para 22 of the monitoring methodology, AMS-II.G, version 05. Parameter SM_y monitors the fraction of project stove usage where baseline stoves continue to be used. The parameter records the value as the number of meals cooked on project stove divided by the total number of meals cooked in a week/04/. The monitoring of the parameter SM_y ensures the compliance to the requirements of the para 26(b) of the monitoring methodology, AMS-II.G, version 05/B02/.</p> <p>CME has done a sampling for the PoA and the only CPA reported in the monitoring period, CPA 1 for the current monitoring period. As no previous monitoring has been done in the PoA, the variance values for the calculation of sample sizes are based on a similar gold standard project being implemented by the project proponent in Kenya (GS reference number 966). PP has clarified in the sampling calculator that the variance values for the calculation of sample sizes are based on a similar gold standard project being implemented by the project proponent in Kenya. To be conservative, the PP further used 'best guess' conservative values to estimate the values for the variance. This is acceptable to the verification team since the estimates are based on result of previous studies and "best guesses" based on the researcher's own experiences. This is in accordance with the para 5 (a) and (c) of the Appendix 1 of the Sampling Guidelines version 4.0 (EB 86 Annex 4)/B08/. A sample size of 19 was determined for the parameter n_y based on the required confidence interval/precision level of 95/10, this sample size was increased to 30 in order to meet the requirements of the sampling standard/B07/. The sample</p>
-------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

size determined for the parameter SM_y based on the required confidence interval/precision level of 95/10 is 61. However, to account for the non-responses CME used a sample of 112 out of which 83 valid responses were obtained for the parameter n_y and 65 valid responses were obtained for the parameter SM_y . The valid responses received by the CME are more than the minimum required sample sizes and thus acceptable to the verification team. The precision achieved for the parameter n_y is 8.92% and thus within the limits of 10% required precision for the parameter. The precision achieved for the parameter SM_y is 6.61% and thus within the limits of 10% required precision for the parameter. A sample size of 19 was determined for the parameter $\eta_{new,y}$ based on the required confidence interval/precision level of 95/10. A sample of 41 was thus chosen to account for the non-responses and 24 valid responses were obtained. The valid responses were more than the required minimum sample size of 19 and thus the sampling results are acceptable to the verification team. The precision achieved for the parameter $\eta_{new,y}$ is 2.06 % and thus within the limits of 10% required precision for the parameter.

The resultant applied sample size by the CME for the CPA1/02/ are summarized below:

Parameters	n_y	SM_y	$\eta_{new,y}$
Calculated Sample	19	61	19
Estimated Sample Size	30 (required minimum sample size)	61	19
Applied Sample Size (to account for non-responses)	112	112	41
Valid Responses	83	65	24
Precision achieved	8.92 %	6.61 %	2.06 %

The precision level achieved for each of the parameters is less than the required precision of 10 and thus it is acceptable to the verification team. The precision level meets the desired precision level and is within the limits. This complies with the requirements of the §24 of the Standard: Sampling and surveys for CDM project activities and programmes of activities (version 05.0)/B07/.

DOE used sampling during verification for checking the operational status and the proportion of meals cooked on the project cookstoves. As per the sampling standard /B07/, DOE had identified 8 samples out of the PP's 65 samples for the parameter SM_y and 83 samples for the parameter n_y based on the AQL/UQL stated below. A sample size of 8 households was chosen (no non-responses observed). A sample size of 8 was required, based on an AQL of 0.5 % and UQL of 20 %, the producer risk used is 5 % and consumer risk used was 20 %. Acceptance number (c) thus determined for the sample is 0. A sample of 8 is justified since the PoA is located in least developed country and meets the requirement of para 31 (c) of the Sampling Standard version 05/B07/. All the identified 8 samples were operational and hence no discrepancy was found (i.e. c=0). The number of meals cooked on the project stoves and on the baseline stoves was also interviewed and the results were same as the responses received during the monitoring and hence no discrepancy was found (i.e. c=0). It was observed that all the cook stoves were in working condition and thus c=0, i.e. no discrepant records were observed with the MR /02/ and the ER sheet /04/. It was observed that the responses on the usage of project stoves and baseline stoves was same as observed at the time of monitoring and thus c=0, i.e. no discrepant records were observed with the MR /02/ and the ER sheet /04/. Thus PP's set of records has been accepted in line with § 30 of the sampling standard (version 05.0) /B07/.

DOE checked the water boiling test report/10/ with records of all the sampled stoves for the verification of the stove efficiency of the project stoves. No sampling was

	required for the verification of the tests of the efficiency conducted.
	Verification team confirms that the sampling approach applied by the CME is in accordance with the revised and approved PoA-DD and the CPA DD /B04/ including the Guidelines: Sampling and surveys for CDM project activities and programmes of activities (version 04.0) /B06/ and Standard: Standard for sampling and surveys for CDM project activities and Programme of Activities (version 05.0) /B07/.

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

Means of verification	Document Review, Interview
Findings	There are no findings on this section of the VR.
Conclusion	<p>Stove sales database/05/ has been used to record the stoves details by the CME. The stove efficiency needs to be checked by the use of measuring equipment used. The stove efficiency testing has been done by WBTs conducted in line with the guidance provided by the CME in the revised and approved PoA-DD and registered/included CPA-DD /B04/. The monitoring equipment used for conducting the stove efficiencies by WBTs is digital thermometer, moisture meter and digital balance. Extech MO210 moisture meter/07-3/ and GoerTek digital thermometer with K-type thermocouple/07-1/ were purchased new prior to testing. The monitoring equipment digital balance/06-2/ and digital thermometer/06-1/ were calibrated prior to the start of the water boiling tests as checked through the review of the calibration certificates. The monitoring equipment has been calibrated by the National Metrology Institute of Ethiopia. The calibration certificate of the equipment confirms that they are calibrated/06/. The appropriate QA/QC procedures have been followed for the monitoring parameters.</p> <p>The verification took cognizance of § 389 and § 394 of VVS (version 09.0) /B01/.</p>

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

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

Means of verification	Document Review, Interview												
Findings	CL 07 had been raised in this regard. Please refer to Appendix 4 below for further details of the CL.												
Conclusion	<p>The equations for baseline emissions, as provided in the monitoring report /02/ and confirmed with the registered CPA-DD /B04/ and the methodology AMS-II.G (version 05.0) /B02/, are:</p> $ER_y = B_{y,savings} \times f_{NRB,y} \times NCV_{biomass} \times EF_{projected_fossilfuel} \times N_{y,i}$ <p>Where:</p> <table> <tr> <td>ER_y</td><td>Emission reductions during the year y in tCO₂e</td></tr> <tr> <td>$B_{y,savings}$</td><td>Quantity of woody biomass that is saved in tonnes</td></tr> <tr> <td>$f_{NRB,y}$</td><td>Fraction of woody biomass saved by the project activity in year y that can be established as non-renewable biomass</td></tr> <tr> <td>$NCV_{biomass}$</td><td>Net calorific value of the non-renewable woody biomass that is substituted (IPCC default for wood fuel, 0.015 TJ/tonne)</td></tr> <tr> <td>$EF_{projected_fossilfuel}$</td><td>Emission factor for the substitution of non-renewable woody biomass by similar consumers. Use a value of 81.6 tCO₂/TJ</td></tr> <tr> <td>$N_{y,i}$</td><td>Number of project devices of type i operating in year y,</td></tr> </table> <p>The project uses Option 2 Equation 3 of the baseline and monitoring methodology AMS-II.G to calculate the parameter $B_{y,savings}$ as shown below:</p> $B_{y,savings} = B_{old} \cdot \left(1 - \frac{\eta_{old}}{\eta_{new}}\right)$	ER_y	Emission reductions during the year y in tCO ₂ e	$B_{y,savings}$	Quantity of woody biomass that is saved in tonnes	$f_{NRB,y}$	Fraction of woody biomass saved by the project activity in year y that can be established as non-renewable biomass	$NCV_{biomass}$	Net calorific value of the non-renewable woody biomass that is substituted (IPCC default for wood fuel, 0.015 TJ/tonne)	$EF_{projected_fossilfuel}$	Emission factor for the substitution of non-renewable woody biomass by similar consumers. Use a value of 81.6 tCO ₂ /TJ	$N_{y,i}$	Number of project devices of type i operating in year y ,
ER_y	Emission reductions during the year y in tCO ₂ e												
$B_{y,savings}$	Quantity of woody biomass that is saved in tonnes												
$f_{NRB,y}$	Fraction of woody biomass saved by the project activity in year y that can be established as non-renewable biomass												
$NCV_{biomass}$	Net calorific value of the non-renewable woody biomass that is substituted (IPCC default for wood fuel, 0.015 TJ/tonne)												
$EF_{projected_fossilfuel}$	Emission factor for the substitution of non-renewable woody biomass by similar consumers. Use a value of 81.6 tCO ₂ /TJ												
$N_{y,i}$	Number of project devices of type i operating in year y ,												

	Where:	
	B _{old}	Quantity of woody biomass used in the absence of the project activity in tonnes
	η_{old}	A weighted average 0.1032 has been used as a weighted average of the traditional three stone fires and the improved cook stoves in Ethiopia. .
	η_{new}	Efficiency of the system being deployed as part of the project activity (fraction), as determined using the Water Boiling Test (WBT) protocol. Use weighted average values if more than one type of system is being introduced by the project activity.

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

Means of verification	Document Review, Interview
Findings	There are no findings on this section of the VR.
Conclusion	There are no project emissions identified in the monitoring methodology /B02/ and the CPA-DD /B04/.

I.6.3. Calculation of leakage GHG emissions

Means of verification	Document Review, Interview
Findings	There are no findings on this section of the VR.
Conclusion	<p>Net-to-gross adjustment factors to account for leakage (NTG) (fixed default values of 0.95 as per AMS II.G. ver.05.0) /B02/ was applied to the project activity to calculate Emission Reductions of this Monitoring Period.</p> <p>Verification team confirms that all parameters are used correctly in the calculations, all results are verifiable and transparent, all assumptions are described and based on verifiable evidence and calculations are done in accordance with the pre-defined formulae from registered CPA-DDs/B04/.</p>

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

Means of verification	Document Review, Interview
Findings	There are no findings on this section of the VR.
Conclusion	<p>Verification team confirms that all parameters are used correctly in the calculations, all results are verifiable and transparent, all assumptions are described and based on verifiable evidence and calculations are done in accordance with the pre-defined formulae from registered CPA-DD. The total number of ERs achieved during the monitoring period is 2,512 tCO₂e.</p> <p>In summary, verification team confirms that actual emission reduction is lower than the estimate of the registered (included)/approved CPA-DD/B04/ for the current monitoring period. The verification took cognizance of § 401 of VVS (version 09.0) /B01/.</p>

Specific-case CPA reference number	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)		
				Results achieved in the period up to 31 December 2012	Results achieved in the period from 1 January 2013 onwards	Results achieved in the entire monitoring period
9672-0001	2,512	0	0	0	2,512	2,512
Total	2,512	0	0	0	2,512	2,512

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

Means of verification	Document Review
Findings	CL 08 had been raised in this regard and has been resolved.
Conclusion	<p>The actual GHG emission reductions are less than the estimates in the included specific-case CPA/B04/. CME has stated that this is due to the slower sales than anticipated. In summary, verification team confirms that actual emission reduction is lower than the estimate of the registered (included) CPA-DD/B04/ for the current monitoring period.</p> <p>The verification took cognizance of § 256 & 257 of the CDM Project Standard (version 09.0) /B01-2/ and § 385 (d) and 402 (c) of VVS (version 09.0)/B01-1/.</p>

Specific-case CPA reference number	Value estimated in ex ante calculation in the included specific-case CPA-DD(s)	Actual values achieved by the specific-case CPA(s) during this monitoring period
9672-0001	122,585	2,512
Total	122,585	2,512

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

Means of verification	Document Review
Findings	There are no findings on this section of the VR.
Conclusion	<p>Verification team confirms that actual emission reduction is lower than the estimate of the registered (included)/approved CPA-DD/B04/ for the current monitoring period.</p> <p>The verification took cognizance of § 256 & 257 of the CDM Project Standard (version 09.0)/B01-2/ and § 385 (d) and 402 (c) of VVS (version 09.0)/B01-1/.</p>

Appendix 1. Abbreviations

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

Appendix 2. Competence of team members and technical reviewers



Carbon Check (India) Private Ltd.

Anubhav Dimri

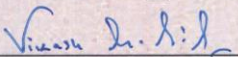
has been qualified as per CCIPL's internal qualification procedures, in accordance with requirements of Accreditation Standard (version 06.0):

For following functions:

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

In the following Technical Areas:

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


Mr. Vikash Kumar Singh
Compliance Officer


Mr. Amit Anand
CEO

Date of Approval
23/12/2016

Valid Till
22/12/2017

Revision History of the Document

26/12/2014	Initial Adoption
24/12/2015	Annual Revision
20/01/2016	Interim Revision for office address change
23/12/2016	Annual Revision

¹India, South Africa

CARBON CHECK (INDIA) PRIVATE LIMITED

Registered in India: U74930DL2012PTC232495

Regd. Off: 2071/38, 2nd Floor, Naiwala, Karol Bagh, New Delhi - 110005

Corporate off: G 49 & 50, 3rd Floor, Sector - 3, NOIDA (Uttar Pradesh) - 201301

Tel: +91 120 4373114 / +91 120 2520027 | URL: www.carboncheck.co.in

e-mail: info@carboncheck.co.in



Carbon Check (India) Private Ltd.

Amit Anand

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

For following functions:

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

In the following Technical Areas:

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

Mr. Vikash Kumar Singh
Compliance Officer

Date of Approval
23/12/2016

Valid Till
22/12/2017

Revision History of the Document

26/12/2014	Initial Adoption
24/12/2015	Annual Revision
20/01/2016	Interim Revision for office address change
23/12/2016	Annual Revision

¹India, South Africa

CARBON CHECK (INDIA) PRIVATE LIMITED

Registered in India: U74930DL2012PTC232495

Regd. Off: 2071/38, 2nd Floor, Naiwala, Karol Bagh, New Delhi - 110005

Corporate off: G 49 & 50, 3rd Floor, Sector - 3, NOIDA (Uttar Pradesh) - 201301

Tel: +91 120 4373114 / +91 120 2520027 | URL: www.carboncheck.co.in

e-mail: info@carboncheck.co.in

Appendix 3. Documents reviewed or referenced

No.	Author	Title	References to the document	Provider
1	The Paradigm Project	1. Webhosted Monitoring report 2. Monitoring report 3. Monitoring report 4. Monitoring report	Version 1, dated 31/12/2016 Version 2, dated 18/04/2017 Version 3, dated 25/04/2017 Version 4, dated 30/04/2017	CME
2	The Paradigm Project	Final Monitoring report	Version 5, dated 08/05/2017	CME
3	The Paradigm Project	4. Emission reduction calculation spread sheets corresponding to /1.1/ 5. Emission reduction calculation spread sheets corresponding to /1.2/ 6. Emission reduction calculation spread sheets corresponding to /1.3/	-	CME
4	The Paradigm Project	Emission reduction calculation spread sheets, corresponding to /2/	-	CME
5	The Paradigm Project	Stove Sales Database	-	CME
6	National Metrology Institute of Ethiopia	Calibration Certificates: 1. Digital Thermometer 2. Digital Balance 3. Moisture meter (Self-calibrated)	TH-01 dated 12/12/2016 OBL-1715 dated 13/12/2016 Extech MO210 (exemption)	CME
7	The Paradigm Project	Manufacturer Specifications for: 1. Digital Thermometer specifications (amazon.com) 2. Digital balance specifications 3. Moisture meter specifications	GoerTek Digital Thermometer AWS SR Series User Manual Extech MO210 User Manual and Data sheet	CME
8	Ministry of Water, Irrigation & Electricity, Ethiopia	WBT Training Certificate for the monitoring manager Mr Zeray Equbay And Training Agenda	Dated 10-11/08/2016	CME
9	The Paradigm Project	Sampling Calculator	-	CME
10	Mekelle University	1. Evaluation of Improved Cook Stoves (Water Boiling Test Certification) 2. Memorandum of Understanding between Paradigm Project and Mekelle University for certification of WBT results	January 2017	CME
11	The Paradigm Project	Quality control check records for parameter Sy (QA/QC Log) Includes Records of follow up calls with end users of the ICS for customer service	-	CME
12	The Paradigm Project	Templates for: 1. Credit Sales Agreement 2. Supply Agreement	-	CME
13	The	Records for:	-	CME

	Paradigm Project	1. End User Agreements 2. Supplier Agreements		
14	The Paradigm Project	WBT Records: 1. Raw Data Sheets 2. WBT Calculations	-	CME
15	The Paradigm Project	Annual review of data collection and data entry to identify systematic errors and general points of weakness in the data management.	MP1: Jan 1, 2016 – Dec 31, 2016	CME
B01	UNFCCC	1. Validation and Verification Standard version 09.0 2. Project Standard version 09.0 3. Project Cycle Procedure version 09.0	http://cdm.unfccc.int/	Others
B02	UNFCCC	Applied baseline and monitoring methodology, AMS-II.G, version 05	http://cdm.unfccc.int/	Others
B03	UNFCCC	Instructions for filling out the monitoring report form for CDM programme of activities version 01.0	http://cdm.unfccc.int/	Others
B04	UNFCCC	Registered/ Revised approved PoA-DD (version 10 dated 27/10/2015); CPA-DD for 9672-0001: (version 8 dated 26/06/2013); and corresponding validation reports.	http://cdm.unfccc.int/	Others
B05	Web sites	Websites: http://cdm.unfccc.int/	--	Others
B06	UNFCCC	Guidelines: Sampling and surveys for CDM project activities and programmes of activities, Version 04.0	http://cdm.unfccc.int/	Others
B07	UNFCCC	Standard: Standard for sampling and surveys for CDM project activities and Programme of Activities, version 05.0	http://cdm.unfccc.int/	Others
B08	UNFCCC	Fraction of non-renewable value for Ethiopia http://cdm.unfccc.int/DNA/fNRB/index.html	--	Others

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

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

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

Table 2. CL from this verification

CL ID	01	Section no.	G.1	Date: 09/04/2017
Description of CL				
<i>In section 1.2 of the MR it is not clear in the column "Is this specific-case CPA covered in this monitoring report? (yes/no)" if "Yes" is applicable to both the CPAs.</i>				
CME response				Date: 18/04/2017
<i>The PP has updated section A.1.2 to identify CPA 9672-0001 (Ethiopia) as the CPA covered in the monitoring report. CPA 9672-0002 (Rwanda) is separately listed and marked with 'No' to specify it is not included in the monitoring report.</i>				
Documentation provided by CME				
<i>Updated MR</i>				
DOE assessment				Date: 23/04/2017
<i>The information on the CPAs covered in the monitoring report has been provided in section 1.2 of the monitoring report and clearly states CPAs covered for the two CPAs included in the PoA.</i>				

CL ID	02	Section no.	H.2	Date: 09/04/2017
Description of CL				
<i>In section B.1 of the MR, it is not clear if there is any CPA operator involved in the CPA/PoA.</i>				
CME response				Date: 18/04/2017
<i>The Paradigm Project, the CME, is also the sole implementing party involved in the CPA. Section B.1 of the MR has been updated to clarify that the CME is also the CPA operator. Additional information describing the CME's decision to directly operate the CPA is provided at section D.1.</i>				
Documentation provided by CME				
<i>Updated MR</i>				
DOE assessment				Date: 23/04/2017
<i>It has been clarified in section B.1 of the MR that the CME, The Paradigm Project, is the sole implementing party involved in the CPA and is the only CPA operator.</i>				

CL ID	03	Section no.	I.1	Date: 09/04/2017
Description of CL				
<i>In section D.1 of the monitoring report the first date of stove installation has been provided as 02/09/2015 and the operating period has been provided as 01/01/2016- 31/12/2016. Also, the date of sale/date of delivery for the first stove in the sales database is 09/02/2015. The inconsistency in the dates has not been explained/clarified by the CME.</i>				
CME response				Date: 18/04/2017

The PP has updated section D.1 of the MR to reflect the correct date of first stove installation as March 25, 2015. The original inconsistency was caused by a data entry error in the MR in which the PP used the American format for the date of first installation (with the month listed first) rather than the standard European format with the day listed first. The revised date of first sale is due to changes related to CL07 and the removal of all missing and duplicate serial numbers.

Documentation provided by CME

N/A

DOE assessment**Date:** 23/04/2017

The date has been corrected in the section D.1 of the MR and is consistent with the stove sales database. PP has further changed the start date to March 25, 2015 due to the inconsistency in the stove numbers.

CL ID	04	Section no.	I.3	Date: 09/04/2017
--------------	----	--------------------	-----	-------------------------

Description of CL

1. In section B.2 of the MR it is stated that a simple random sampling approach has been chosen however section B.3 of the PoA-DD specifies stratified random sampling as the sampling approach. It needs to be clarified how the sampling chosen by the CME meets the requirements of the PoA-DD.
2. In the 'sampling calculator' spreadsheet the size of the population does not match with the value of the parameter S_y as has been reported as 5,241 in section G.2 of the MR.

CME response**Date:** 18/04/2017

1. Section B.2 of the MR has been updated to clarify that a stratified random sampling approach was used, as consistent with the PoA-DD. Each stratum is defined by the Host Country and technology type; thus, a single stratum was used for sampling under this monitoring period. A simple random sample was used within this stratum.
2. Sampling was conducted prior to monitoring. As the time of sampling, all stoves delivered were included in the sampling frame and calculations. Additional stoves were added to the customer database for sales delivered from September through December 31, 2016. The total stoves sales were updated prior to the close of the monitoring period to reflect all stoves distributed during the monitoring period. The PP confirmed that the monitored sample met the precision and accuracy requirements specified in the PoA-DD.

Documentation provided by CME

Updated MR

DOE assessment**Date:** 28/04/2017

1. It has been clarified that stratified random sampling was used for sampling in the PoA, however since only one host country and one technology (type of stove) was applicable during the monitoring period and thus random sampling was used within the stratum.
2. PP has clarified that the sampling size was calculated prior to monitoring and the monitoring surveys were started, however there were stoves that were added during sampling and they have been added to the list of the total population of the stoves. The actual precision achieved from the sample from the total population has been calculated for each parameter in ER spreadsheet and the precision level is within the desired level defined in the registered CPA-DD.

However, it has been observed that a total of 112 households were surveyed to determine the value for the parameters n_y and SM_y as per the sampling calculator and the section B.2 of the MR. The records provided in the ER sheet are only for 83 end users. Similarly for parameter $\eta_{new,y}$ a sample of 41 was determined from the sampling calculator and as reported in the MR, but the records are only provided for 24 end users.

CME response**Date:** 30/04/2017

The PP has updated section B.2 of the MR to include details on the samples achieved and the reasons for non-response in the non-surveyed households.

Documentation provided by CME

Updated MR: 01_MR ParadigmEthiopiaPoA 9672 30April2017

DOE assessment**Date:** 30/04/2017

The updates have been made in the section B.2 of the MR, however it has been noticed that the required sample size from the sampling calculator has not been achieved. The reference of the values used for the variance used for the sample size calculation for the parameters n_y , SM_y and $\eta_{new,y}$ in the sampling calculator is also not clear.	
CME response	Date: 30/04/2017
<p>The PP has updated section B.2 of the MR to clarify that the minimum calculated sample required is 19 households for parameter n_y, 61 households for parameter SM_y and 19 households for parameter $N_{new,y}$. The PP has clarified in section B.2 that a sample of 112 households for parameters n_y and SM_y and 41 households for parameter $\eta_{new,y}$ was used to ensure sufficient households would be reached to meet sampling and precision requirements for the monitoring.</p> <p>The PP has further updated the sampling calculator to include all stoves within the monitoring period (5,187) and to include estimates based on the researcher's best guess for Ethiopia (the more conservative estimates used for sampling) and based on data gathered on wood stoves of a similar age in Kenya.</p> <p>The PP did not use the ex-ante values from the CPA-DD because these values were using estimates for several strata in a single country, indicating much greater variation that is representative of a single technology and strata, as is the case with the first monitoring period. Further, the number of units represented in the CPA-DD monitoring plan is 102,000 ICS, versus the 5,187 units in the current monitoring period. Thus the PP used two other approaches, as presented in the CDM guideline for sampling and surveys, a) the result of previous studies and c) 'best guesses' based on the researcher's own experience.</p> <p>The PP chose to use data for wood stoves of a similar age from its project in Kenya. These stoves include data for the EzyStove and, based on research conducted in the field, all wood stoves within the Kenya project are treated as the same technology given that they have the same efficiency and monitored use in households. Thus the researcher considered this data relevant for comparison with Ethiopia.</p> <p>To be conservative, the researcher used 'best guess' conservative values to estimate efficiency changes, usage dropoff and a range of usage frequency (SM_y) values. Since the researchers 'best guess' was more conservative than the data analysed from Kenya, the more conservative values were used for estimating sample sizes.</p>	
Documentation provided by CME	
Updated MR and Sampling calculator.	
DOE assessment	Date: 01/05/2017
PP has clarified that the sample of 112 households for parameters n_y , SM_y and 41 for parameter $\eta_{new,y}$ was applied to account for the non-responses. The actual sample sizes determined for the parameter n_y is 19 households, for the parameter SM_y is 61 and 19 households for the parameter $\eta_{new,y}$. PP has further clarified in the sampling calculator that the variance values for the calculation of sample sizes are based on a similar gold standard project being implemented by the project proponent in Kenya. To be conservative, the PP further used 'best guess' conservative values to estimate the values for the variance. This is acceptable to the verification team since the estimates are based on results of previous studies and "best guesses" based on the researcher's own experiences. This is in accordance with the para 5 (a) and (c) of the Appendix 1 of the Sampling Guidelines version 4.0 (EB 86 Annex 4).	

CL ID	05	Section no.	I.3	Date: 09/04/2017
Description of CL				
<i>It needs to be clarified how the compliance to the para 26 of the methodology is being met by the project activity.</i>				
CME response				Date: 18/04/2017
<i>Monitored parameter SM_y is compliant with paragraph 26 section b of the methodology, excluding any continued use of baseline stoves from the calculation of Bold.</i>				
Documentation provided by CME				
N/A				
DOE assessment				Date: 23/04/2017
PP has clarified that in order to meet the compliance of the para 26 of the methodology AMS-II.G version 05, para 26 (b) of the methodology has been opted and monitored parameter SM_y is used to monitor the fuelwood consumption from the baseline stoves that continue to be used.				

CL ID	06	Section no.	I.4.2	Date: 09/04/2017
Description of CL				
<i>It needs to be clarified that how the stated annual monitoring frequency of the monitoring parameters S_y, SM_y and $\eta_{new,y}$ is met as the monitoring period is for more than one year.</i>				
CME response				Date: 18/04/2017

<i>The monitoring period is from January 1, 2016 to December 31, 2016. Thus the requirement for annual monitoring is met as the monitoring period is for one calendar year. Section G.2 of the MR has been updated to specify that all monitored parameters are annual and the crediting period is for one calendar year.</i>	
Documentation provided by CME	
Updated MR	
DOE assessment	Date: 23/04/2017
PP has clarified that the monitoring period is from January 1, 2016 to December 31, 2016 as the ERs are being claimed for this period. In section D.1 of the MR, the operating period under this MR has been stated as 01/01/2016 – 31/12/2016, however on cover page of the MR, the monitoring period has been stated as 01/09/2013-31/12/2016. It needs to be clarified if no ERs are being claimed for the period 01/09/2013 – 31/12/2015 and the reason for the same.	
CME response	Date: 28/04/2016
The PP has clarified that the monitoring and operating period under this MR is from September 1, 2013 to December 31, 2016. These dates are reflected in the cover page and section D.1 of the MR. It has been clarified in section D.1 of the MR that no ERs are being claimed from September 1, 2013 to December 31, 2015.	
Documentation provided by CME	
Updated MR	
DOE assessment	Date: 28/04/2016
It has been clarified by the PP that the monitoring and operating period under the MR is from 01/09/2013 to 31/12/2016. However, ERs are not being claimed from the period 01/09/2013 to 31/12/015.	

CL ID	07	Section no.	I.6.1	Date: 09/04/2017
Description of CL				
<i>There are some duplicate serial number in the sales database (Registrations workbook) with the numbers prefixed by 00xxxxx and xxxxx. It needs to be clarified if such stoves are same or different as the customer name is different for such stoves.</i>				
<i>In the 'Unit Sales Calcs' workbook of the ER sheet stove numbers are not provided in the cells C5255(Invoice pending), C622, C495, C134 and C135 (blanks)</i>				
<i>In the 'ER calculations' workbook of the ER sheet 365 days have been used in cell J14 in the year even though the number of days have been used as 366 in Unit Sales Calcs Column I.</i>				
CME response				Date: 25/04/2016
<i>The PP has updated the sales database to remove any duplicate or missing serial numbers.</i>				
Documentation provided by CME				
<i>ER calculations workbook with updated sales to standardize serial number formats and remove any duplicate and missing serial numbers. Cell J14 of the 'ER calculations' sheet of the ER calculations workbook has also been updated to reflect 366 days (rather than 365) days in the 2016 calendar year.</i>				
DOE assessment				Date: 27/04/2017
The sales database has been updated and all the duplicate entries have been removed. The cells have the correct stove numbers and all the stoves where the end user details are not available in the monitoring period shall only be added in the next monitoring period. The number of days in the calendar year would have also been adjusted correctly.				

CL ID	08	Section no.	I.6.5	Date: 09/04/2017
Description of CL				
<i>It is not clear in section H.5 of the MR how the estimated ERs have been calculated.</i>				
CME response				Date: 18/04/2017
<i>Section H.5 of the MR has been updated to reflect the total ERs estimated for years 1-3 (2014-2016), totalling 90,362 ERs.</i>				
Documentation provided by CME				
Updated MR				
DOE assessment				Date: 23/04/2017
The value of the estimated ERs in the section H.5 of the MR has been updated. However, it has been checked through the review of the ex-ante calculation sheet at the time of registration that for the monitoring period 01/09/2013 to 31/12/2016 total 3 years and 4 months have been used for calculation instead of only 3 year used for the calculation in section H.5 of the MR.				
CME response				Date: 25/04/2016

The PP has updated section H.5 of the MR to include the full ex-ante values of 3 years and 4 months from 01/09/2013 – 31/12/2016. The following table outlines ex-ante emissions for the period:

YEAR1	DATES	EX-ANTE EMISSIONS
1	01/09/2013 – 31/12/2013	14,775
2	01/01/2014 – 31/12/2014	39,783
3	01/01/2015 – 31/12/2015	35,804
4	01/01/2016 – 31/12/2016	32,224
TOTAL		122,585*

* Summed figures account for rounding in the ER ex-ante emissions calculator

Documentation provided by CME	
Updated MR	
DOE assessment	Date: 28/04/2017
PP has updated section H.5 of the MR to include the full ex-ante values of 3 years and 4 months from 01/09/2013 – 31/12/2016. The total number of estimated ERs is 122,585 tCO ₂ e for the period. The total number of actual ERs are 2,550 tCO ₂ e for crediting period which is lower than the credits for the monitoring period. Since the credits are being claimed only for the period 01/01/2016 to 31/12/2016, the actual ERs of 2,550 tCO ₂ e is less than the estimated ERs for the period 01/01/2016. The value of actual ERs has not been rounded down in the ER sheet.	
CME response	Date: 30/04/2017
The PP has updated the ER calculator to round down the total number of ERs. All ERs reported in the MR have been updated to reflect the rounded down number of 2,512.	
Documentation provided by CME	
Updated ER calculator: 02_ER Calculations CPA-01-ETH Iss1 30April2017 and updated MR: 01_MR ParadigmEthiopiaPoA 9672 30April2017	
DOE assessment	Date: 30/04/2017
The actual ERs have been updated in the MR and the ER sheet and the value is a rounded down value.	

Table 3. CAR from this verification

CAR ID	01	Section no.	G.1	Date: 09/04/2017
Description of CAR				
<ol style="list-style-type: none"> Font used in the MR does not meet the template requirement. Blank rows have been provided in sections H.4 and H.5 of the MR. In section G.1 of the MR Purpose of data not is not provided in accordance with the MR instruction text requirement. 				
CME response				Date: 18/04/2017
Font in the MR has been updated to match the template formatting				
Documentation provided by CME				
Updated MR				
DOE assessment				Date: 23/04/2017
<p>2. The blank rows in sections H.4 and H.5 of the MR are still present in the MR.</p> <p>3. In accordance with the MR instruction text from the MR template form "For the row "Purpose of data" in the tables in G.1 and G.2, choose one of the following options:</p> <p>(a) Calculation of baseline emissions or baseline net GHG removals by sinks;</p> <p>(b) Calculation of project emissions or actual net GHG removals by sinks;</p> <p>(c) Calculation of leakage."</p> <p>In section G.1 of the MR, in Purpose of data row, the purpose has been stated as "Used in calculation of the emissions reductions", the stated purpose is not in compliance with the available options.</p>				
CME response				Date: 25/04/2016
<p>2. Blank rows have been removed from sections H.4 and H.5 of the MR</p> <p>3. The PP has updated tables in G.1 and G.2 of the MR to reflect the available options for the Purpose of Data row.</p>				
Documentation provided by CME				
Updated MR				

DOE assessment	Date: 28/04/2017
2. The blank rows have been deleted from the sections H.4 and H.5 of the MR.	
3. The tables in sections G.1 and G.2 of the MR have been updated to provide the correct Purpose of Data. The date on the cover page for the monitoring report has not been provided in the DD/MM/YYYY format.	
CME response	Date: 30/04/2017
The PP has updated the date on the cover page of the MR has been updated to the format of DD/MM/YYYY.	
Documentation provided by CME	
Updated MR	
DOE assessment	Date: 01/05/2017
The date on the cover page has been provided in the DD/MM/YYYY format.	

CAR ID	02	Section no.	I.3	Date: 09/04/2017
Description of CAR				
<i>The annual energy savings per household and the total has not been provided to demonstrate the compliance to the para 4 of the methodology AMS-II.G version 5 in the ER sheet and MR.</i>				
CME response				Date: 21/04/2017
<i>The PP has updated the 'ER Calculations' sheet of the ER calculator to include the per unit GW savings and the overall GW savings within the CPA for the monitoring period. The PP has updated the MR section D.1 section d to include information on compliance with para 4 of the methodology re the GW cap per CPA.</i>				
Documentation provided by CME				
Update MR and ER calculations workbook				
DOE assessment				Date: 23/04/2017
The annual energy savings per household and the total energy savings have been provided in the ER sheet and section D.1 of the MR. However, the reference to page 53 of the PDD is incorrect. Please clarify if it is PoA-DD or CPA-DD.				
Also, the units for per device have been stated as tonnes per device in section D.1. The units of the thermal savings has to be provided correctly.				
CME response				Date: 25/04/2017
The PP has updated the reference to page 53 in the ER calculations sheet to clarify that it is page 53 of the PoA-DD.				
The PP has updated section D.1 of the MR to correct the usage of tonnes per device. It is now stated as savings in GWh per device.				
Documentation provided by CME				
Updated MR and ER calculations workbook				
DOE assessment				Date: 28/04/2017
The reference to the correct page from the PoA-DD has been updated in the ER sheet.				
The section D.1 of the MR has been updated to provide the correct units for thermal savings per device.				
The value of the actual ERs in the ER sheet has not been rounded down and instead is rounded up.				
CME response				Date: 30/04/2017
The PP has updated the ER calculator to round down the total number of ERs. All ERs reported in the MR have been updated to reflect the rounded down number of 2,512.				
Documentation provided by CME				
Updated ER calculator: 02_ER Calculations CPA-01-ETH Iss1 30April2017 and updated MR: 01_MR ParadigmEthiopiaPoA 9672 30April2017				
DOE assessment				Date: 30/04/2017
The actual ERs have been updated in the MR and the ER sheet and the value is a rounded down value.				

CAR ID	03	Section no.	I.4.2	Date: 09/04/2017
Description of CAR				
<i>The monitored value of the parameter $\eta_{new,y}$ in section G.2 of the MR is more than the value in the registered CPA-DD. The reason for increase in the efficiency needs to be provided.</i>				
CME response				Date: 21/04/2017

EzyStove testing to provide the ex-ante value in the CPA-DD was done at Aprovecho research center in Oregon in the United States. The tests were performed on a single EzyStove in laboratory conditions using locally available wood and a flat-bottomed 3 liter pot filled with 2.5 liters of water. The WBT 4.1.2 protocol was used for the testing. Thermal efficiency test results ranged from 27-29.2%, with an average of 27.8% thermal efficiency and a COV of 4%.

The testing completed during the monitoring period was done in local conditions in Ethiopia using locally available wood and a rounded-bottom 7 liter pot filled with 5 liters of water. The WBT 4.2.4 protocol was used for the testing. Thermal efficiency test results ranged from 24.6-42.8%, with an average of 30.79% thermal efficiency and a COV of 16.7%.

There are several factors that could explain the slight difference in average results between the two tests. The primary difference is the larger volume of tests performed: 24 unique stoves tested once as opposed to 1 stove tested 3 times in the Aprovecho tests. There are also variations in the local temperature, altitude, moisture content in the air and wood used during testing. Further, the tests during the monitoring period were performed using a locally appropriate pot with a rounded bottom, which is known to have a positive effective on energy transfer to the pot and could thus improve the average thermal efficiency. Differences in pot sizes can also be a contributing factor to variance in the data. Further, slight variations in the WBT protocols used (4.1.2 versus 4.2.4) could contribute to changes in the performance of tests and calculations of thermal efficiency. Finally, the EzyStove tested for the ex-ante value was a mass-manufactured model made in China. Minor modifications, including materials improvements and a better aerated fuel shelf, could have contributed to a slight improvement in average thermal efficiency.

In conclusion, the overall data gathered during the WBT tests during this monitoring period are within the range of values presented under the Aprovecho tests, but due to the broader and more varied nature of the tests, have a larger COV. There are a variety of small differences between the environment and execution of the two tests that could lead to the slight variation in average thermal efficiency, but it would be impossible to pinpoint a single factor. The PP believes that the data gathered during the WBT monitoring exercise accurately represents the performance of the stove in the local conditions in Ethiopia and is not materially different from the range of values presented in the ex-ante testing.

Documentation provided by CME

N/A

DOE assessment

Date: 23/04/2017

PP has clarified that the difference in the efficiency determined during the monitoring is due to the following factors:

1. Higher number of stoves used during the monitoring as compared to ex-ante calculations and thus more variation.
2. The impact of local factors like temperature, altitude, moisture content in the air and wood used during testing.
3. The pot type used during monitoring was with rounded bottom.
4. Material improvement from the manufacturer at the time of ex-ante testing to the actual stoves delivered.

Since, the difference in the determined efficiency during monitoring and the ex-ante value is of 2.9%, from the professional experience of the verification team and based on the reasons provided by the PP the value is justified. Also, since the project stoves are new with a low usage rate (SMY), the value of the efficiency is justified. The supporting documents for the calibration of the measurement equipment have been checked by the verification team to check consistency and found to be appropriate.

Table 4. FAR from this verification

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

Appendix 5. Data and parameters fixed ex ante

Data/Parameter	η_{old} (Efficiency of the system being replaced)
Default values used:	0.1032
Purpose of data	Baseline emission calculation
Source and Verification of the source	The value has been determined ex-ante based on the baseline survey conducted. The value has been compared with the registered CPA-DD/B04/ and found correct by the verification team.

Data/Parameter	NTG (Net to gross adjustment factor of to account for leakage)
Default values used:	0.95
Purpose of data	Baseline emission calculation
Source and Verification of the source	Default value as per the methodology AMS II.G (Ver. 5)/B02/. The value has been compared with the registered CPA-DD/B04/ and found correct by the verification team.

Data/Parameter	f_{NRB} (Fraction of woody biomass saved by the project activity in year y that can be established as non-renewable biomass)
Default values used:	0.88
Purpose of data	Baseline emission calculation
Source and Verification of the source	Default values from the CDM SSC_WG Information note on default f_{NRBs} /B08/ calculated using the methodology prescribed in the baseline and methodology AMS-II.G version 05/B02/. The value has been compared with the registered CPA-DD/B04/ and found correct by the verification team.

Data/Parameter	NCV_{biomass} (Net calorific value of the non-renewable woody biomass that is substituted)
Default values used:	0.015 TJ/tonne
Purpose of data	Baseline emission calculation
Source and Verification of the source	IPCC default value as per the methodology AMS II.G (Ver. 5)/B02/. The value has been compared with the registered CPA-DD/B04/ and found correct by the verification team.

Data/Parameter	EF_{projected_fossilfuel} (Emission factor for the substitution of non-renewable biomass by similar consumers)
Default values used:	81.6 tCO ₂ /TJ
Purpose of data	Baseline emission calculation
Source and Verification of the source	Default value as per the methodology AMS II.G (Ver. 5)/B02/. The value has been compared with the registered CPA-DD/B04/ and found correct by the verification team.

Data/Parameter	B_{old} (Quantity of woody biomass used in the absence of the project activity in tonnes per device per year)
Default values used:	3.4545
Purpose of data	Baseline emission calculation
Source and Verification of the source	The value has been determined based on the baseline survey in accordance with the methodology AMS-II.G version 05/B02/.

In summary, the verification team confirms that all the ex-ante and ex-post parameters are monitored in accordance with the approved monitoring plan and applied methodology. The verification took cognizance of § 247 and 248 of the CDM Project Standard (version 09.0)/B01-2/ and § 401, 402 and 403 of the VVS (version 09.0)/B01-1/.

Appendix 6. Data and parameters monitored

Monitoring Parameter Requirement	Assessment/ Observation by the DOE
Data / Parameter: (as in monitoring plan of PDD):	S_y (Number of distributed ICS in year y)
Measuring frequency/Time Interval:	Continuously
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
Details of monitoring equipment:	No monitoring equipment used to determine the parameter number of distributed ICS in year y.
Is accuracy of the monitoring equipment as stated in the PDD? If the PDD does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practise?	Not Applicable as no equipment has been used to determine the parameter.
Calibration frequency /interval: Is it monitoring methodology /CDM EB guidance / local or national standards / manufacturers specification	Not Applicable as no equipment has been used to determine the parameter.
Is the calibration interval in line with the monitoring plan of the PDD? If the PDD does not specify the frequency of calibration, does the selected frequency represent good monitoring practise?	Not Applicable as no equipment has been used to determine the parameter.
Company performing the calibration (internal or external calibration):	Not Applicable as no equipment has been used to determine the parameter.
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	Not Applicable as no equipment has been used to determine the parameter.
Is (are) calibration(s) valid for the whole reporting period?	Not Applicable as no equipment has been used to determine the parameter.
If applicable, has the reported data been cross-checked with other available data?	Yes, reported data in MR/02/ has been compared with ER sheet/04/ and the sales database/05/.
How were the values in the monitoring report verified?	The values in the monitoring report/02/ were compared against the values in ER sheet/04/ and the sales database/05/.
Does the data management (from data generation to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the data management ensures correct transfer of data and reporting of emission reductions and all necessary QA/QC processes are in place.
In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	Not applicable as full data is available for the entire monitoring period.

Monitoring Parameter Requirement	Assessment/ Observation by the DOE
Data / Parameter: (as in monitoring plan of PDD):	n_y (Fraction of distributed ICS operational in year y)
Measuring frequency/Time Interval:	Annually
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
Details of monitoring equipment:	No monitoring equipment is used. Source of data is from

	sales records database.
Is accuracy of the monitoring equipment as stated in the PDD? If the PDD does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practise?	Not Applicable as no equipment has been used to determine the parameter.
Calibration frequency /interval: Is it monitoring methodology /CDM EB guidance / local or national standards / manufacturers specification	Not Applicable as no equipment has been used to determine the parameter.
Is the calibration interval in line with the monitoring plan of the PDD? If the PDD does not specify the frequency of calibration, does the selected frequency represent good monitoring practise?	Not Applicable as no equipment has been used to determine the parameter.
Company performing the calibration (internal or external calibration):	Not Applicable as no equipment has been used to determine the parameter.
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	Not Applicable as no equipment has been used to determine the parameter.
Is (are) calibration(s) valid for the whole reporting period?	Not Applicable as no equipment has been used to determine the parameter.
If applicable, has the reported data been cross-checked with other available data?	Yes, the value of parameter has been crosschecked with the monitoring database/05/, ER sheet/04/ and sample sales agreements/13/ and the hard copy records were also checked during the OSV. The reported values for the sampled households have been checked from the questionnaire answers as provided in the ER sheet/04/ and the sampling calculator/09/.
How were the values in the monitoring report verified?	The reported data has been cross-checked against the questionnaire answers as provided in the ER sheet/04/ and compared with the MR/02/.
	The data was then verified against the sample households checked during the site visit.
Does the data management (from data generation to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the data management ensures correct transfer of data and reporting of emission reductions and all necessary QA/QC process are in place.
In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	Not applicable as full data is available for the entire monitoring period.

Monitoring Parameter Requirement	Assessment/ Observation by the DOE
Data / Parameter: (as in monitoring plan of PDD):	D_y (Cumulative number of days which ICSs have been operational in year y)
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
Details of monitoring equipment:	No monitoring equipment is used.
Is accuracy of the monitoring equipment as stated in the PDD? If the PDD does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practise?	Not Applicable as no equipment has been used to determine the parameter.

Calibration frequency /interval: Is it monitoring methodology /CDM EB guidance / local or national standards / manufacturers specification	Not Applicable as no equipment has been used to determine the parameter.
Is the calibration interval in line with the monitoring plan of the PDD? If the PDD does not specify the frequency of calibration, does the selected frequency represent good monitoring practise?	Not Applicable as no equipment has been used to determine the parameter.
Company performing the calibration(internal or external calibration):	Not Applicable as no equipment has been used to determine the parameter.
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	Not Applicable as no equipment has been used to determine the parameter.
Is (are) calibration(s) valid for the whole reporting period?	Not Applicable as no equipment has been used to determine the parameter.
If applicable, has the reported data been cross-checked with other available data?	Yes, reported data in MR/02/ has been compared with ER sheet/04/ and the sales database/05/.
How were the values in the monitoring report verified?	The values in the monitoring report/02/ were compared against the values in ER sheet/04/ and the sales database/05/.
Does the data management (from data generation to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the data management ensures correct transfer of data and reporting of emission reductions and all necessary QA/QC processes are in place.
In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	Not applicable as full data is available for the entire monitoring period.

Monitoring Parameter Requirement	Assessment/ Observation by the DOE
Data / Parameter: (as in monitoring plan of PDD):	SM_y (Fraction of meals in a week cooked on the project stove in year y)
Measuring frequency/Time Interval:	Annually
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
Details of monitoring equipment:	No monitoring equipment is used.
Is accuracy of the monitoring equipment as stated in the PDD? If the PDD does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practise?	Not Applicable as no equipment has been used to determine the parameter.
Calibration frequency /interval: Is it monitoring methodology /CDM EB guidance / local or national standards / manufacturers specification	Not Applicable as no equipment has been used to determine the parameter.
Is the calibration interval in line with the monitoring plan of the PDD? If the PDD does not specify the frequency of calibration, does the selected frequency represent good monitoring practise?	Not Applicable as no equipment has been used to determine the parameter.
Company performing the calibration(internal or external calibration):	Not Applicable as no equipment has been used to determine the parameter.
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	Not Applicable as no equipment has been used to determine the parameter.
Is (are) calibration(s) valid for the whole reporting period?	Not Applicable as no equipment has been used to determine the parameter.

If applicable, has the reported data been cross-checked with other available data?	Yes, the value of parameter has been crosschecked with the monitoring database/05/, ER sheet/04/ and sample sales agreements/13/ and the hard copy records were also checked during the OSV. The reported values for the sampled households have been checked from the questionnaire answers as provided in the ER sheet/04/ and the sampling calculator/09/.
How were the values in the monitoring report verified?	The reported data has been cross-checked against the questionnaire answers as provided in the ER sheet/04/ and compared with the MR/02/.
	The data was then verified against the sample households checked during the site visit.
Does the data management (from data generation to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the data management ensures correct transfer of data and reporting of emission reductions and all necessary QA/QC process are in place.
In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	Not applicable as full data is available for the entire monitoring period.

Monitoring Parameter Requirement	Assessment/ Observation by the DOE
Data / Parameter: (as in monitoring plan of PDD):	$\eta_{new,y}$ (Efficiency of the device being deployed as part of the project activity in year y)
Measuring frequency/Time Interval:	Annually
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
Details of monitoring equipment:	GoerTek Digital Thermometer /07/ AWS SR Series Digital Balance /07/ Extech MO210 Moisture Meter /07/
Is accuracy of the monitoring equipment as stated in the PDD? If the PDD does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practise?	No accuracy of equipment is not stated in the CPA-DDs.
Calibration frequency /interval: Is it monitoring methodology /CDM EB guidance / local or national standards / manufacturers specification	The equipment used has been calibrated prior to the use during monitoring: The calibration of the digital thermometer has been done on 12/12/2016, for digital balance on 13/12/2016 by the national metrology institute, ministry of science and technology, Ethiopia/06-1,2/. Further, the manufacturer specification of the moisture meter Extech MO210 confirms that it is self-calibrated and just requires pressing of a button prior to use for calibration/07/. Verification team thus confirms that the equipment is calibrated prior to use.
Is the calibration interval in line with the monitoring plan of the PDD? If the PDD does not specify the frequency of calibration, does the selected frequency represent good monitoring practise?	The calibration interval has not been provided in the CPA-DD. However, since the equipment is calibrated prior to use the selected frequency represent good monitoring practise.
Company performing the calibration(internal or external calibration):	External. National metrology institute, ministry of science and technology, The Federal Democratic Republic of Ethiopia/06/.

CDM-PoA-VCR-FORM

Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	Yes, the calibration confirmed proper functioning of the monitoring equipment.
Is (are) calibration(s) valid for the whole reporting period?	Yes, the calibration is valid for the whole reporting period.
If applicable, has the reported data been cross-checked with other available data?	Yes, the value of parameter has been crosschecked with the raw data sheets for the WBTs and calculation sheets/14/, ER sheet/04/ and the hard copy records were also checked during the OSV. The reported values for the sampled households have been checked from the ER sheet/04/ and the sampling calculator/09/.
How were the values in the monitoring report verified?	The reported data has been cross-checked against the raw data sheets for the WBTs and calculation sheets/14/ and compared with the ER sheet/04/ and the MR/02/.
Does the data management (from data generation to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the data management ensures correct transfer of data and reporting of emission reductions and all necessary QA/QC process are in place.
In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	Not applicable as full data is available for the entire monitoring period.

- - - - -

Document information

<i>Version</i>	<i>Date</i>	<i>Description</i>
01.0	5 June 2015	Initial publication.
Decision Class: Regulatory Document Type: Form Business Function: Issuance Keywords: programme of activities, verifying and certifying		