



**Verification and certification report form for
CDM programme of activities
(Version 03.0)**

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

BASIC INFORMATION

Title and UNFCCC reference number of the programme of activities (PoA)	African Improved Cooking Stoves Programme of Activities: 5342	
Version number(s) of the PoA-DD(s) to which this report applies	4.3	
Version number of the verification and certification report	3	
Completion date of the verification and certification report	23/11/2020	
Monitoring period number and duration of this monitoring period	Seventh Monitoring Period 01/07/2019 – 31/03/2020 (Both days inclusive)	
Number and version number of the monitoring report to which this report applies	Monitoring Report Number: 2 Monitoring Report Version: 3.0	
Coordinating/managing entity (CME)	Envirofit International Ltd.	
Host Parties	Host Parties of the PoA	Is this a host Party to a CPA covered in this report? (yes/no)
	Ghana	No
	Nigeria	Yes
	Liberia	No
Applied methodologies and standardized baselines	AMS-II.G ver 3.0: Energy efficiency measures in thermal applications of non-renewable biomass Standardized baseline: NA	
Mandatory sectoral scopes	Sectoral scope: 3: Energy demand	
Conditional sectoral scopes, if applicable	NA	
Estimated amount of GHG emission reductions or GHG removals for this monitoring period in the included CPAs covered in this report	99,285 tCO ₂ e	
Certified amount of GHG emission reductions or GHG removals for this monitoring period for the included CPAs covered in this report	26,164 tCO ₂ e	
Name and UNFCCC reference number of the DOE	E0066: Earthood Services Private Limited	

Name, position, and signature of the
approver of the verification and certification
report



Dr. Kaviraj Singh
Managing Director

SECTION A. Executive summary

The aim of the PoA is the distribution of improved biomass cookstove in Ghana, Nigeria, and Liberia. Thus, PoA through the distribution of improved stoves aims at reducing the GHG emissions by replacing the less efficient non-renewable biomass based cookstove with a more efficient one.

In the absence of the PoA non-renewable biomass (wood and charcoal) is used as fuel in the traditional three stone cookstoves. The distributed stove has better efficiency; thus, it provides the same amount of energy with less fuel consumption and also releases less GHG emission.

This verification covers stove distribution in Nigeria under three CPAs i.e. 5342-P1-0007-CP1, 5342-P1-0008-CP1 and 5342-P1-0009-CP1.

The verification team confirms that the total emission reductions achieved under this monitoring period 01/07/2019 – 31/03/2020 (Both days inclusive) are 26,164 tCO₂e

Scope of verification:

The verification is an independent and objective review, of ex-post determination of the monitored reductions in GHG emissions, by the DOE. The verification includes the assessment of implementation and operation of the PoA as set out in the revised accepted PoA-DD & CPA-DDs viz., 5342-P1-0007-CP1, 5342-P1-0008-CP1, 5342-P1-0009-CP1 in the monitoring period.

The verification tests the data and assertions set out in the monitoring report for this monitoring period by the CMEs and is based on the following:

- (i) The approved methodology AMS-II.G ver 3.0: Energy efficiency measures in thermal applications of non-renewable biomass/6/ applied in the PoA-DD/1/ & CPA-DDs/2,3,4/
- (ii) The registered and revised accepted PoA-DD & CPA-DDs and monitoring plan/1,2,3,4/
- (iii) UNFCCC criteria referred to in the Kyoto Protocol criteria and the CDM modalities and procedures as agreed in the Bonn Agreement and the Marrakech Accords
- (iv) The CDM Validation and Verification Standard (VVS) for PoA version 2.0/9/
- (v) The CDM Project Standard (PS) for PoA /7/ and Project Cycle Procedure (PCP) for PoA version 2.0 /8/
- (vi) Relevant decisions, guidance, and clarifications of the CMP and CDM Executive Board and any other information and references relevant to the project activity's reported emission reductions

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

Verification Process:

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

- a) Contract with CME and appointment of verification team and technical review team (refer Section B.1 and B.2 of this report)
- b) Completeness check of Monitoring Report
- c) Publication of Monitoring Report at UNFCCC website
- d) Desk review (refer Section D.1 of this report) of Monitoring Report and corresponding ER sheet by verification team and planning of Remote Audit Survey (including sampling approach (refer Section D.4 of this report) to be applied)
- e) During Remote Audit Survey (refer Section D.2 of this report) (interview with relevant stakeholders) by verification team consisted of Team Leader and all Technical Experts, as a minimum
- f) Follow up activities e.g., interviews (refer Section D.3 of this report)
- g) Reporting and closure of findings (CARs/CLs/FARs) and preparation of draft verification report (refer Section D.5 of this report)

- h) Independent technical review (refer Section F of this report) of the draft verification report and final/revised documentation (e.g., Monitoring Report, corresponding ER sheet and corresponding supporting evidences)
- i) Reporting and closure of TR comments/findings (refer Section D.5 of this report) (CARs/CLs/FARs) and final approval for the decision made (refer Section G and H of this report).
- j) Issuance of final verification report to contracted CME (or authorized representatives) and submission of request for issuance to UNFCCC, as appropriate.

Verification Conclusion:

Based on the outcome of the verification process of the registered/revised accepted PoA “African Improved Cooking Stoves Programme of Activities” and its 3 CPAs (**5342-P1-0007-CP1**, **5342-P1-0008-CP1**, **5342-P1-0009-CP1**) for the monitoring period **01/07/2019 – 31/03/2020** (including both dates), it is confirmed that the implementation of referenced registered/revised accepted PoA and CPAs are complying with applicable CDM rules and regulations. The GHG emission reductions were calculated correctly based on the methodologies AMS-II.G. ver 3.0: Energy efficiency measures in thermal applications of non-renewable biomass and the monitoring plan contained in the registered PoA-DD.

Earthood Services Private Limited can certify that the emission reductions from the registered CDM PoA UN#5342 “African Improved Cooking Stoves Programme of Activities” in Nigeria during the period **01/07/2019 – 31/03/2020** (including both days) amount to **26,164 tCO₂e**. Therefore, this is being submitted for a request for issuance, as per UNFCCC procedures

SECTION B. Verification team, technical reviewer and approver

B.1. Verification team members

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)	Involvement in			
						Desk/document review	On-site inspection*	Interview(s)	Verification findings
1.	Team Leader	IR	Mahala	Deepika	Central Office	Y	N	Y	Y
2.	Verifier	IR	Vatsa	Vaishali	Central Office	Y	N	Y	Y
3.	Technical Expert	IR	Mahala	Deepika	Central Office	Y	N	Y	Y
4.	Methodology Expert	IR	Mahala	Deepika	Central Office	Y	N	Y	Y
5.	Local Expert	EI	Luka	Nanbal	Central Office	Y	N	Y	N

*Remote Audit Survey was conducted

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	Gautam	Ashok	Central Office
2.	TA to TR	IR	Gautam	Ashok	Central Office
3.	Approver	IR	Singh	Kaviraj	Central Office

SECTION C. Application of materiality in conducting the verification

C.1. Consideration of materiality in planning the verification

No.	Risk that could lead to material errors, omissions or misstatements	Assessment of the risk		Response to the risk in the verification plan and/or sampling plan
		Risk level	Justification	
1.	Observational error by monitoring survey staff of CME/CPA implementer while recording the responses of users in relation to survey parameters	High	The survey is conducted for representative samples of population, which may impact the population significantly. Surveyors may be unsupervised at the site.	Verification team randomly selected the samples from CME surveyed HHs. The recorded survey forms by CME were checked with DOE remote survey observations. The verification team interviewed the monitoring staff and checked their training records.
2.	Calculation Errors	Med	The process in manual and therefore there is potential risk of errors / omissions/misstatements.	All calculations were checked by verification team with respect to applicable requirements under various documents viz., methodology, PoA DD/1/, CPA DDs/2,3,4/ etc.

C.2. Consideration of materiality in conducting the verification

In accordance with CDM VVS for PoAs, Version 02.0/9/ the prescribed thresholds for materiality for CDM PoAs are as under;

Type of PoA	PoAs comprising large-scale CPAs			PoAs comprising only small-scale CPAs	PoAs comprising only micro-scale CPAs
Emission Reductions (tCO ₂ e)/year	500,000 or more	300,001 to 499,999	300,000 or less		
Materiality Threshold	0.5%	1.0%	2.0%	5.0%	10.0%

The applicable materiality threshold is 5% as PoA comprises only small-scale CPAs.

Particulars / Monitoring Report	MR Version (Public)	MR Version (Revised/Final)
Emission Reductions Achieved (tCO ₂ e) in this monitoring period	37,557	26,164*
Applicable Threshold (%) as per CDM VVS for PoAs Version 02.0	5.0%	5.0%

*The decrease in the ER's of the final monitoring report/13/ is due to typographical errors identified in the ER sheet which have been considered at the time of verification.

Monitored Parameter (Symbol / Description)	Reporting Frequency	Number of Discrete Data (Total) Total (100%)	Sample selected for verification Sample (%)	Type of error identified	Impact on ERs	
					ERs impacted (Sample)	ERs impacted (Population based on extrapolation)
CPA-5342-P1-0007-CP1, 5342-P1-0008-CP1, 5342-P1-0009-CP1						
For ICS:						
$\eta_{new,y}$ (Efficiency of the device being deployed as	Annually	29	29(100% data was checked)	None	NA	NA

part of the project activity in year y)						
N_{all} (Total number of stoves installed)	Annually	5342-P1-0007-CP1: 4,000 5342-P1-0008-CP1: 4,000 5342-P1-0009-CP1:3336	ICS database/5/ was checked for the information And 22 ICS were checked during the Remote Audit Survey/10/	None	NA	NA
SOF (Stove Operation Fraction – used to determine the share of distributed stoves that are still operating, measured ex-post through sampling)	Annually	127 (SOF _{charcoal} : 83; SOF _{woodfuel} : 44)	Usage and Monitoring survey/11/ results were checked, and 22 ICS were checked during the Remote Audit Survey/10/	None	NA	NA
f_{old} (Fraction of end users that are still using baseline stoves)	Annually	124 (f _{oldCharcoal} : 80; f _{oldwoodfuel} : 44)	Usage and Monitoring survey/11/ results were checked, and 22 ICS were checked during the Remote Audit Survey/10/	None	NA	NA
μ_{old} (The amount of woody biomass consumption that is consumed through the continued use of old stoves)	Annually	8 (μ _{old} Charcoal: 0; μ _{old} woodfuel: 8)	Usage and Monitoring survey/11/ results were checked, and 8 ICS were checked during the Remote Audit Survey/10/	None	NA	NA
Stove_{year} Calculated average stove	Annually	5342-P1-0007-CP1: 4,000 5342-P1-0008-	ER calculation sheet/12/ was	None	NA	NA

operation years in the monitoring period. If stoves have been operating for 365 days, then $\text{Stove}_{\text{year}} = 1.0$. If less than 365 days, then $\text{Stove}_{\text{year}}$ is represented as a fraction of 365 (eg. 180 days = 0.5).		CP1: 4,000 5342-P1-0009-CP1:3,336	checked.			
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Based on the above table it can be confirmed that the actual individual and aggregated material error is determined for the registered PoA as per CDM VVS for PoA/09/. The applicable threshold for materiality in accordance with CDM PoA VVS Version 2 para 308(d)/9/ is 5%.

SECTION D. Means of verification

D.1. Desk/document review

>>A desk review was conducted by the verification team that included:

- A review of data and information provided for its completeness.
- A review of registered monitoring plan, monitoring methodologies including applicable tools, standards, and the applicable applied standardized baselines.

All the documents reviewed during the verification process are listed in Appendix 3 of VCR.

D.2. On-site inspection

Duration of on-site inspection: NA				
No.	Activity performed on-site	Site location	Date	Team member
1.	Interview of the monitoring personnel and CME representative	-	22/06/2020-23/06/2020	Deepika Mahala and Vaishali Vatsa
2.	Interview of the head of the institution related to the DoE sampled project devices	-	22/06/2020-23/06/2020	Deepika Mahala and Vaishali Vatsa

No physical on-site inspection was conducted for this verification. However, alternative means of site visit were adopted by the assessment team as explained in following sections of this report.

Mandatory Site-visit

In-line to para 322 of VVS for PoA Version 2.0/9/, site-visit for the current verification was not mandatory as these 3 CPAs (5432-P1-0007-CP1 to 5432-P1-0009-CP1) have already been verified by ESPL previously, and a physical on-site visit was conducted on 07/10/2019-10/10/2019 under their first verification. Also, none of these CPAs have achieved more than 300,000 tCO₂e since the last visit.

Planned Site-Visit

Nevertheless, an on-site visit was initially planned from 15/06/2020. However, with the COVID-19 outbreak and increased exposure risk due to international travel and nation-wide lockdown imposed in India (DOE office country), by the Government of India, the on-site visit was not possible as per the original plan. An advisory issued by the Indian Ministry of Health & Family Welfare on 30/05/2020 said that "There will be

phase-wise reopening of the country and the International air travel has been listed under phase III and the dates for re-starting shall be decided later to the assessment of the situation"/44/.

However, due to COVID-19 outbreak the situation in the country has not become stable yet and the lockdown has been extended by the government in contaminated zones. The situation of pandemic sprawl is not improving in the country by each passing day and the date to which the site visit can be postponed was uncertain. Thus, alternate means of site visit were chosen by the verification team instead of conducting on-site visit.

The issue with the postponement of Site-visit:

The on-site audit assessment for this verification could not be postponed as the cases of coronavirus were rising with an extremely high number of death rates in many countries/43/. The Indian government had banned international flights since March and the ban has still not been lifted /49/. By each passing day, it was not clear when the travel ban would get lifted. Delaying the site visit would have led to delayed issuance of the CERs. The CME relies upon the CER revenue generated from the project for the working capital of the project. It was clarified by the CME that along with the impact on the generation of the working capital of the project, the delay in the project will also lead to the delay in meeting the project CER retirement time-line and eventually leading to the cancellation of the CERs issued from the project (as set under Appendix 1 of the ERPA/41/):

Projected Retirement Volume	Deadline
250,515 CERs	01/12/2020

Exemption by CDM EB

Due to the outbreak of COVID-19, CDM-EB has exempted site visits for all projects till 31/12/2020. An internal checklist with details of CPA and alternative means for site-visit exemption was submitted to the Technical Manager for approval, in accordance with the ESPL CDM QMS, before conducting the remote site visit.

Alternative means applied

Following alternative means have been used to verify the project details:

1. Remote Audit Surveys including interviews of CME/CPA Implementer, end users and the personnel's involved in monitoring and preparation of the monitoring report and related documents via e-meeting. Random samples for eleven ICS users per sampling frame (i.e. Total 22 samples) (details on sampling provided in section D.3) were drawn from the CME's monitoring sample survey sheet and interviewed through skype calls.
2. Photographic evidences of the ICSs /39/, Installed ICSs with Unique Serial IDs/40/, Monitoring Survey (filled) Forms/24/.
3. Monitoring personnel training manual/20/
4. WBT evidences (WBT summary sheet/12/, WBT efficiency calculator/32/, WBT replacement sheet/46/, WBT stove test pictures/33/, WBT Training evidences/36/, WBT Equipment pictures/34/, WBT filled forms /35/.
5. Review of the other Documentary evidences (ER sheet/12/ Sample Size Calculation sheet, Monitoring Report Data Sheet, WBT Summary Sheet)

D.3. Interviews

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1.	Lohia	Rohit	Envirofit International	22/06/2020-23/06/2020	Monitoring Report, Sampling methodology, ER calculations	Deepika Mahala, Vaishali Vatsa and Nanbal Luka
2.	Olaore	Biodun	Envirofit (Director)_West Africa	22/06/2020-23/06/2020	CPA Implementation	Deepika Mahala, Vaishali Vatsa and Nanbal Luka
3.	Diedo	Elizabeth	Envirofit (Nigeria)	22/06/2020-23/06/2020	Monitoring Survey	Deepika Mahala, Vaishali Vatsa and Nanbal Luka
4.	Abiodun	Elizabeth	ICS User (CH2200)	22/06/2020	DOE Remote Audit Survey	Deepika Mahala, Vaishali Vatsa
5.	Eniola	Ibironke	ICS User (CH2200)	22/06/2020	DOE Remote Audit Survey	Deepika Mahala, Vaishali Vatsa
6.	Akinpelu	Mrs.	ICS User (Econochar)	22/06/2020	DOE Remote Audit Survey	Deepika Mahala, Vaishali Vatsa
7.	Olaniyan	Olusola	ICS User (Econochar)	22/06/2020	DOE Remote Audit Survey	Deepika Mahala, Vaishali Vatsa
8.	Oladehinde	Rebecca	ICS User (CH2200)	22/06/2020	DOE Remote Audit Survey	Deepika Mahala, Vaishali Vatsa
9.	Shanoulu	Idowu	ICS User (CH2200)	22/06/2020	DOE Remote Audit Survey	Deepika Mahala, Vaishali Vatsa
10.	Akinola	Oluyemisi B	ICS User Econochar	23/06/2020	DOE Remote Audit Survey	Deepika Mahala, Vaishali Vatsa and Nanbal Luka
11.	Mary	Akintola	ICS User Econochar	23/06/2020	DOE Remote Audit Survey	Deepika Mahala, Vaishali Vatsa and Nanbal Luka
12.	Atah	Anna	ICS User Econofire	23/06/2020	DOE Remote Audit Survey	Deepika Mahala, Vaishali Vatsa and Nanbal Luka
13.	Subairu	Halimat	ICS User Econofire	23/06/2020	DOE Remote Audit Survey	Deepika Mahala, Vaishali Vatsa and Nanbal Luka
14.	Blessing	Johnson	ICS User Econofire	23/06/2020	DOE Remote Audit Survey	Deepika Mahala, Vaishali Vatsa and Nanbal Luka
15.	Ojapa	Sarah	ICS User Econofire	23/06/2020	DOE Remote Audit Survey	Deepika Mahala, Vaishali Vatsa and Nanbal Luka
16.	Safuna	Aliyu	ICS User Econofire	23/06/2020	DOE Remote Audit Survey	Deepika Mahala, Vaishali Vatsa and Nanbal Luka
17.	Omede	Christiana	ICS User Econofire	23/06/2020	DOE Remote Audit Survey	Deepika Mahala, Vaishali Vatsa and Nanbal Luka
18.	Modibo	Ayisatu	ICS User	23/06/2020	DOE Remote Audit	Deepika Mahala,

			Econofire		Survey	Vaishali Vatsa and Nanbal Luka
19.	Sule	Bori	ICS User Econofire	23/06/2020	DOE Remote Audit Survey	Deepika Mahala, Vaishali Vatsa and Nanbal Luka
20.	Rasaq	Olukan	ICS User Econofire	23/06/2020	DOE Remote Audit Survey	Deepika Mahala, Vaishali Vatsa and Nanbal Luka
21.	Elom	Maria	ICS User Econofire	23/06/2020	DOE Remote Audit Survey	Deepika Mahala, Vaishali Vatsa and Nanbal Luka
22.	Jeere	Majere	ICS User Econofire	23/06/2020	DOE Remote Audit Survey	Deepika Mahala, Vaishali Vatsa and Nanbal Luka
23.	Fadekemi	Oyewole	ICS User Econochar	23/06/2020	DOE Remote Audit Survey	Deepika Mahala, Vaishali Vatsa and Nanbal Luka
24.	Adufe	Folawiyo	ICS User Econochar	23/06/2020	DOE Remote Audit Survey	Deepika Mahala, Vaishali Vatsa and Nanbal Luka
25.	Oyedepo	Muibat	ICS User Econochar	23/06/2020	DOE Remote Audit Survey	Deepika Mahala, Vaishali Vatsa and Nanbal Luka

D.4. Sampling approach

CME's Sampling approach

For sampling, CME has followed the Standards for Sampling and Surveys for CDM project activities and programme of activities /15/ which is in-line with the PoA DD/1/. The CME has applied Simple Random Sampling at PoA level for different monitoring parameters as per validated PoA DD /1/and registered CPA DDs/2-4/. 95/10 confidence precision was applied by CME in the sampling which is appropriate as per the single sampling covering 3 CPAs. Thus, CPA-wide single sampling plan was used by the CME.

DOE's Sampling Approach

In order to meet the requirements of paragraph 30 and 31 of Standard for Sampling and surveys for CDM project activities and programmes of activities, Version 8/15/ the verification team applied acceptance sampling in the verification (in accordance with para 28). The verification team selected random sample of CME's sampled records to check the acceptability (or otherwise) of the data for each such record with CME's sample records and determine if the CME's sample records meet the requirements.

The current verification is for 5342-P1-0007-CP1, 5342-P1-0008-CP1, 5342-P1-0009-CP1.

The verification team has selected the sample size as 11 ICSs of each type- charcoal and wood, for the purpose of remote survey to check the acceptability of CME's sampling results or otherwise. In total 22 samples were checked.

Sample Size: (Per Sampling Frame)

CPA Ref No.	AQL	UQL	Producer Risk	Consumer Risk	Sample Size; Min	Acceptance No.
5342-P1-0007-CP1, 5342-P1-0008-CP1, 5342-P1-0009-CP1	0.5%	20%	10%	10%	11	0

The verification team selected the random samples of CME's sampled records to check the acceptability (or otherwise) of the data for each such record with CME's sample records, and determine if the CME's sample records meet the requirements. The sampled HHs confirmed that they own only one ICS, they confirmed the UIDs as well as the operational status of the ICS. All the ICS were found to be operational. No discrepant records were observed by the verification team.

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

Areas of verification findings	No. of CL	No. of CAR	No. of FAR
General	-	-	-
Compliance of the monitoring report with the monitoring report form	-	-	-
Remaining forward action requests from validation and/or previous verifications	-	-	-
CPAs considered for verification and covered in this report	-	-	-
Programme of activities	-	-	-
Compliance of the programme implementation with the registered PoA-DD	-	CAR#03	-
Implementation and operation of the management system	-	-	-
Post-registration changes	-	-	-
• Corrections	-	-	-
• Inclusion of a monitoring plan	-	-	-
• Permanent changes to the registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines, or other methodological regulatory documents ¹	-	-	-
• Changes to the programme design	-	-	-
• Addition of CPA inclusion template	-	-	-
• Change of coordinating/managing entity	-	-	-
• Changes specific to afforestation and reforestation activities	-	-	-
Component project activities	-	-	-
Compliance of the CPA implementation with the included CPA design document	-	-	-
Post-registration changes	-	-	-
• Temporary deviations from registered monitoring plan, applied methodologies, standardized baselines or other methodological regulatory documents	-	-	-
• Corrections	-	-	-
• Changes to the start date-of the crediting period	-	-	-
• Inclusion of a monitoring plan	-	-	-
• Permanent changes to the registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines, or other methodological regulatory documents	-	-	-
• Changes to the project design	-	-	-
• Changes specific to afforestation and reforestation activities	-	-	-
Compliance of the registered monitoring plan with applied methodologies and standardized baselines	-	-	-
Compliance of monitoring activities with the registered monitoring plan	-	-	-
• Data and parameters fixed ex ante or at renewal of crediting period	-	-	-

¹ Other standards, methodologies, methodological tools, and guidelines (to be) applied in accordance with the applied(selected) methodologies are collectively referred to as the other (applied) methodological regulatory documents).

• Data and parameters monitored	CL#01	CAR#02	-
• Implementation of sampling plan	CL#02	-	-
Compliance with the calibration frequency requirements for measuring instruments	-	-	-
Assessment of data and calculation of emission reductions or net removals	-	-	-
• Calculation of baseline GHG emissions or baseline net GHG removals by sinks	-	-	-
• Calculation of project GHG emissions or actual net GHG removals by sinks	-	-	-
• Calculation of leakage GHG emissions	-	-	-
• Summary of calculation of GHG emission reductions or net GHG removals by sinks	-	CAR#01	-
• Comparison of actual GHG emission reductions or net GHG removals by sinks with estimates in included CPA	-	-	-
• Remarks on difference from estimated value in included CPA	-	-	-
Assessment of reported sustainable development co-benefits	-	-	-
Global stakeholder consultation	-	-	-
Others (please specify)	-	-	-
Total	02	03	00

SECTION E. Verification findings

E.1. General

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

Means of verification	The monitoring report form used is CDM-PoA-MR-FORM version 03.0/17/ which is an appropriate form and the latest version available at the time of verification/submission for a request for issuance. All the sections of the aforesaid form were duly filled as per the guidelines and provided all the relevant details.
Findings	No finding was raised.
Conclusion	The final monitoring report /13/ is found to be in-line with the latest CDM-PoA-MR-form/17/ available and the instructions therein.

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

No FAR was raised during the previous verification.

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

Title and UNFCCC reference number of the CPA included in the PoA as of the end of this monitoring period	Is the CPA considered for this verification? (yes/no)	The date when the CPA was included	Version of the PoA-DD	Confirmation that a request for issuance including the CPA has been published for the previous monitoring period (Y/N)
African Improved Cooking Stoves Programme of Activities CPA 00001 (Ghana) Version: 3.2 Ref: 5342-P1-0001-CP1	No	06/12/2012	Version 4.3 dated 07/06/2014	NA
African Improved Cooking Stoves Programme of Activities CPA 00002 (Ghana) Version: 3.0 Ref: 5342-P1-0002-CP1	No	21/10/2013	Version 4.3 dated 07/06/2014	NA

African Improved Cooking Stoves Programme of Activities CPA 00003 (Ghana) Version: 2.0 Ref: 5342-P1-0003-CP1	No	08/11/2013	Version 4.3 dated 07/06/2014	NA
African Improved Cooking Stoves Programme of Activities CPA 00004 (Nigeria) Version: 6.1 Ref: 5342-P1-0004-CP1	No	23/09/2014	Version 4.3 dated 07/06/2014	NA
African Improved Cooking Stoves Programme of Activities CPA 00005 (Nigeria) Version: 6.1 Ref: 5342-P1-0005-CP1	No	23/09/2014	Version 4.3 dated 07/06/2014	NA
African Improved Cooking Stoves Programme of Activities CPA 00006 (Liberia) Version: 2.0 Ref: 5342-P1-0006-CP1	No	31/12/2014	Version 4.3 dated 07/06/2014	NA
African Improved Cooking Stoves Programme of Activities CPA 00010 (Nigeria) supported by Republic of Korea Version: 4.0 Ref: 5342-P1-0007-CP1	Yes	05/04/2019	Version 4.3 dated 07/06/2014	Yes ²
African Improved Cooking Stoves Programme of Activities CPA 00011 (Nigeria) supported by Republic of Korea Version: 4.0 Ref: 5342-P1-0008-CP1	Yes	05/04/2019	Version 4.3 dated 07/06/2014	Yes ²
African Improved Cooking Stoves Programme of Activities CPA 00012 (Nigeria) supported by Republic of Korea Version: 4.0 Ref: 5342-P1-0009-CP1	Yes	05/04/2019	Version 4.3 dated 07/06/2014	Yes ²
African Improved Cooking Stoves Programme of Activities CPA 00013 (Liberia) supported by Republic of Korea Version: 4.0 Ref: 5342-P1-0010-CP1	No	05/04/2019	Version 4.3 dated 07/06/2014	NA

² https://cdm.unfccc.int/PoAIssuance/iss_db/poaiss969797698/view

African Improved Cooking Stoves Programme of Activities CPA 00014 (Liberia) supported by Republic of Korea Version: 4.0 Ref: 5342-P1-0011-CP1	No	05/04/2019	Version 4.3 dated 07/06/2014	NA
African Improved Cooking Stoves Programme of Activities CPA 00015 (Liberia) supported by Republic of Korea Version: 4.0 Ref: 5342-P1-0012-CP1	No	05/04/2019	Version 4.3 dated 07/06/2014	NA
African Improved Cooking Stoves Programme of Activities CPA 00007 (Ghana) supported by Republic of Korea Version: 2.0 Ref: 5342-P1-0013-CP1	No	12/04/2019	Version 4.3 dated 07/06/2014	NA
African Improved Cooking Stoves Programme of Activities CPA 00008 (Ghana) supported by Republic of Korea Version: 2.0 Ref: 5342-P1-0014-CP1	No	12/04/2019	Version 4.3 dated 07/06/2014	NA
African Improved Cooking Stoves Programme of Activities CPA 00009 (Ghana) supported by Republic of Korea Version: 2.0 Ref: 5342-P1-0015-CP1	No	12/04/2019	Version 4.3 dated 07/06/2014	NA

E.2. Programme of activities

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

Means of verification	<p>The PoA, through the distribution of efficient improved cookstoves in Nigeria, aims at reducing GHG emissions by replacing less efficient non-renewable biomass based cookstove. This monitoring period includes the implementation and monitoring of 3 CPAs from 5342-P1-0007-CP1, 5342-P1-0008-CP1 & 5342-P1-0009-CP1 in Nigeria. The coordinating and managing entity (CME) are Envirofit International Ltd. and CERPD Co., Ltd. is the CPA implementer/18/. CERPD has fully sponsored the ICS to beneficiary households in the CPAs, as well as covered the cost of operation and management of the CPAs. Their roles and responsibilities are defined in the signed agreement.</p> <p>In the absence of the project activity, the ends users would have cooked on traditional three stone stove and used non-renewable biomass as fuel leading to the release of a high amount of GHG emissions in the baseline.</p> <p>CPAs of this PoA covered in the verification report involve dissemination of following types of ICS:</p> <ol style="list-style-type: none"> 1. Econofire /SmartSaver Wood (Wood Fuel)
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2. Econochar / SmartSaver Charcoal and CH2200 (Charcoal)

Stove Specifications:/19/

Parameter description	Econofire /SmartSaver Wood	Econochar /SmartSaver Charcoal	CH2200
Thermal Efficiency	30.2 %	34.3 %	38.2%
Unit Size	25.5 x 40 x 35.5 cm (height x width x depth)	28 x 37 x 42 cm (height x width x depth)	15.4 x 31.3 x 22.9 cm (height x width x depth)
Unit Weight	2.7 kg	3.7 kg	2.3 kg
CO emissions % improvement	77%	70%	50%

All the models are portable and have a grate. The details of the ICS models installed were verified from the manufacturer's specification/19/ provided by the CME. In-line to footnote 7 of the CPA-DDs/2-4/, CME has included model CH2200 in the CPAs under verification during current monitoring period as it meets the eligibility criteria (4) of the inclusion of CPA. The thermal efficiency of the model number CH2200 was found to be 38.2% as per the manufacturer specification/19/ which was more than the average thermal efficiency of 20% as required by the eligibility criteria for inclusion of CPA in PoA. The compliance of CH2200 with relevant methodological / eligibility requirement for inclusion of CPA in the PoA was assessed and found acceptable by the verification team.

During the Remote Audit Survey, the installations of the ICS claimed by the CME were checked and found to be in-line with the technical description provided in the Monitoring report/13/.

Also, the verification team checked the implementation status of the project activity and found it to be as defined in the registered PoA-DD/1/, and MR/13/.

Interview of the personnel involved in the QA/QC procedures revealed that the procedures mentioned in the PoA-DD/1/ were being followed and the training records/20/ regarding the trained personnel were checked.

During the desk review stated address of the 22 samples (selected for RSV) in the CPA-distribution database/5/ were verified while interviewing the end-user and further it was cross-checked using the latlong website/48/ to confirm whether the selected samples of the implemented CPAs lie within the boundary of the PoA and found to be in-line with the registered PoA-DD/1/ and MR/13/.

Further, based on the review of ICS end user database (presented in ER sheet)/5/, and interview conducted during the remote audit survey, the verification team found that:

- The CPA(s) were implemented within the boundary of the PoA as described in the revised accepted PoA-DD/1/.
- The CME is the same as that mentioned in the revised accepted PoA-DD/1/
- The implementation and operation of the project activity has been conducted in accordance with the description contained in the PoA-DD/1/ and included CPA-DDs/2-4/.
- All physical features of the CPA proposed in the included CPA-DDs/2-4/

were in place

- The project participants/CPA implementer has operated the CPAs as per the included CPA DDs/2-4/.
- All sampled users had only 1 unit of project stove

Remote Audit Survey was conducted by the verification team; 11 ICSs with wood type (Econofire), 11 ICSs of charcoal fuel consuming stove (Econochar and CH2200) were audited remotely. The uniqueness of the system was identified from stove serial number written on the units on the cookstove itself/10/. Along with the unique stove serial No. the following details are also noted in the database:

- Name of customer
- Address / location of the customer
- Stove unique serial ID number
- Stove Model
- Stove distribution date
- Type of old / baseline stove replaced by ICS, i.e. the fuel type used in the old / baseline stove

The information of the installed cookstoves was also verified from the CME ICS database/5/ which was cross checked for 22 samples (11 samples for each sampling frame) with the warranty cards and other supporting documents/10/.

The emission reductions being claimed during this monitoring period are lesser than the estimated emission reductions in the CPA-DDs/2-4/, as given in the table under section E.3.6.5. for comparable estimated ERs in the CPA DDs/2-4/ for the corresponding period.

The energy savings achieved by each CPAs was found to be as follows:

CPA-Reference Number	Total Annual Energy Savings	Threshold Limit
5342-P1-0007-CP1	37.71 GWh _{th} /year	180 GWh _{th} /year
5342-P1-0008-CP1	35.15 GWh _{th} /year	
5342-P1-0009-CP1	22.91 GWh _{th} /year	

Thus, the CPAs are within the threshold limits of the applied methodology/6/.

The monitoring report was compared and verified against the description provided in the registered/revised accepted PoA-DD/1/ and found to be correct.

Findings

CAR#03 was raised and resolved.

Conclusion

- The verification team through the remote audit survey and on the basis of the physical site-visit observation during the previous verification confirms that the physical features (technology/type of ICS) of the implementation were in accordance with the registered/ revised-accepted PoA-DD/01/.
- The distribution of ICS is below the estimated quantity given in the respective CPA-DDs/2-4/.
- The actual operation is in line to the respective CPA-DD, which is further explained under Section E.3 of this report. The total actual achieved CERs for CPAs **5342-P1-0007-CP1**, **5342-P1-0008-CP1**, **5342-P1-0009-CP1** (combined) is significantly less than the estimated ERs for the same period. The reason for decrease is limited distribution of ICS as compared to the ex-ante estimated quantity in CPA-DDs. Apart from this, no information about data and variables was identified that may surpass the estimated quantity of ERs in the respective CPA DDs/2-4/.
- The difference in emission reductions achieved by each specific case CPA DD in comparison to that estimated quantity in the corresponding CPA DDs/2-4/ are appropriately justified.

E.2.2. Implementation and operation of the management system

Means of verification	<p>The verification team during the Remote Audit Survey through the interview of the CME representative, Monitoring Personnel and other ICS users assessed the management systems in place to implement the monitoring plan of the PoA. This included the roles and responsibilities, data collection, transfer and aggregation procedures, data storage and archiving for the monitoring system during the previous physical inspection/45/ and re-confirmed through interviewing the CME and other project personnel during current monitoring period. The roles and responsibilities, data collection, transfer and aggregation procedures, data storage and archiving for the monitoring system have been provided in the MR /13/ and were verified through interviews with the CME and other people involved in the project.</p> <p>CME/CPA implementers maintain the CPA distribution records /23/ at the time of distribution to record the details of the end user, ICS model, the serial number of the ICS installed, and the kind of stove replaced. All the information is transferred to ICS distribution database/5/ by the CME which was checked during the desk-review to confirm that the management system is in place. The ICS database was cross-checked against the CPA distribution records of the sampled ICS users to confirm that information for any system installed (unique ID) is consistent between the records. The unique stove serial ID number of the ICS was checked for all the sampled systems during the remote audit survey to ensure that no number is repeating in the database and the same system is not credited in any other CPA either, thus avoiding the double counting.</p> <p>A monitoring team has been organized by the CME consisting of trained monitoring staff, who conducted the WBT test /35/ and monitoring surveys/24/. The monitoring manager of CME is responsible for QA/QC of the data, analysis and reporting in the monitoring report. QA/QC procedures were found being followed as confirmed during the remote audit survey and was also verified at the time of previous verification/45/. Completed monitoring survey forms and WBT test results/24/ and end user agreements cum CPA distribution records /23/were made available to the verification team for assessment of the information of HHs in the CPA Installation data and survey and test results mentioned in ER calculator /12/. Monitoring team staff were interviewed by the verification team regarding the monitoring procedures, using the water boiling test and filling the monitoring questionnaires. The verification team also checked training records of the monitoring & data recording personnel/20/.</p> <p>Thus, it can be confirmed that the Implementation and operation of the management system have been done in line with the registered/ revised-accepted PoA DD/1/ and CPA DDs/2-4/.</p>
Findings	No findings were raised.
Conclusion	The verification team from the desk review and remote audit survey assessment confirms that the monitoring management system of the PoA is in place with the responsibilities properly identified and established.

E.2.3. Post-registration changes**E.2.3.1. Corrections**

No correction was observed/identified.

E.2.3.2. Inclusion of a monitoring plan

N/A

E.2.3.3. Permanent changes to the registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines, or other methodological regulatory documents

N/A

E.2.3.4. Changes to the programme design

Changes in the programme design were included through PRC-5342-001, which made to expand the project boundary to include Liberia under the PoA. The PRC was approved on 16/07/2014. For more detail, refer the following link:

<https://cdm.unfccc.int/PRCContainer/DB/prcp237694862/view>

E.2.3.5. Addition of CPA inclusion template

N/A

E.2.3.6. Change of coordination/managing entity

N/A

E.2.3.7. Changes specific to afforestation and reforestation activities

N/A

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

Means of verification	The registered PoA aims at disseminating improved cookstoves in Ghana, Liberia, and Nigeria. The PoA is primarily designed to replace the existing non-renewable woody biomass dependent cookstove by installing Improved cookstoves instead to provide easy access to clean and affordable energy.																																																								
	CERPD Co., Ltd. is the implementer of the CPAs and has fully implemented the CPAs with the help of Sales and Distribution Partner (SDP). The same has been verified from the agreement between the CME and CPAI/18/.																																																								
	This monitoring period includes the implementation and monitoring of 3 CPAs- CPA 5342-P1-0007-CP1 to CPA 5342-P1-0009-CP1 in Nigeria.																																																								
	<table><tr><th colspan="2">CPA no.</th><th>5342-P1-0007-CP1</th><th>5342-P1-0008-CP1</th><th>5342-P1-0009-CP1</th><th>MoV /Ref ID/</th></tr><tr><td colspan="2">First ICS Installation date</td><td>05/11/18</td><td>05/11/18</td><td>05/11/18</td><td>ICS database /5/</td></tr><tr><td colspan="2">Inclusion date</td><td>05/04/19</td><td>05/04/19</td><td>05/04/19</td><td>UN website /25/</td></tr><tr><td colspan="2">CP start date</td><td>05/04/19</td><td>05/04/19</td><td>05/04/19</td><td>UN website /25/</td></tr><tr><td rowspan="3">No. of units</td><td>Econofire</td><td>974</td><td>748</td><td>430</td><td>ICS data base/5/</td></tr><tr><td>Econochar</td><td>2,600</td><td>1,574</td><td>1,784</td><td>ICS data base/5/</td></tr><tr><td>CH2200*</td><td>426</td><td>1,678</td><td>1,122</td><td>ICS data base/5/</td></tr><tr><td colspan="2">Estimated ERs</td><td>33,095</td><td>33,095</td><td>33,095</td><td>CPA DDs /2-4/</td></tr><tr><td colspan="2">ERs achieved</td><td>10,302</td><td>9,604</td><td>6,258</td><td>ER sheet /12/</td></tr></table>					CPA no.		5342-P1-0007-CP1	5342-P1-0008-CP1	5342-P1-0009-CP1	MoV /Ref ID/	First ICS Installation date		05/11/18	05/11/18	05/11/18	ICS database /5/	Inclusion date		05/04/19	05/04/19	05/04/19	UN website /25/	CP start date		05/04/19	05/04/19	05/04/19	UN website /25/	No. of units	Econofire	974	748	430	ICS data base/5/	Econochar	2,600	1,574	1,784	ICS data base/5/	CH2200*	426	1,678	1,122	ICS data base/5/	Estimated ERs		33,095	33,095	33,095	CPA DDs /2-4/	ERs achieved		10,302	9,604	6,258	ER sheet /12/
	CPA no.		5342-P1-0007-CP1	5342-P1-0008-CP1	5342-P1-0009-CP1	MoV /Ref ID/																																																			
	First ICS Installation date		05/11/18	05/11/18	05/11/18	ICS database /5/																																																			
	Inclusion date		05/04/19	05/04/19	05/04/19	UN website /25/																																																			
	CP start date		05/04/19	05/04/19	05/04/19	UN website /25/																																																			
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ERs achieved		10,302	9,604	6,258	ER sheet /12/																																																				
*CH2200 was not listed in the registered CPA DDs/2-4/. However, footnote 7 of the CPA-DDs/2-4/ states that ‘more models may be included in the CPA subsequently if they meet methodological / eligibility requirement for inclusion of CPA in the PoA. Thus, the distribution of CH2200 under the CPAs was found to be in line with the registered CPA DDs/2-4/. The technical description of CH200 has been assessed under section E.2.1. of this report. The compliance of CH2200 with relevant methodological / eligibility requirement for inclusion of CPA in the PoA was assessed and found acceptable by the verification team.																																																									
The verification team confirms that:																																																									
1. Each of the independent subsystems/measures included in the CPA of a PoA is no larger than 1% of the small-scale thresholds (180 GWh or 1.8 GWhth/year) defined by the applied methodology criteria stated in the CPA DD/2-4/ and PoA DD/1/ as verified through the ER sheet/12/.																																																									
2. The target population is households only as verified through remote audit survey.																																																									

	<p>The implementation of the CPA as mentioned above is within the geographical boundary of PoA-DD/1/, which constitutes the physical boundary as well. Envirofit International Ltd. is the CME of the CPA and CEPRD Co. Ltd. is the CPAI/18/.</p> <p>The reference number and the inclusion date of CPAs have been checked and verified from the UN website/25/ and the details are found correct and consistent. The start date of CPAs was confirmed from the evidence provided /21/. The ICS are installed across Nigeria</p> <p>The verification team also confirmed following:</p> <ol style="list-style-type: none"> 1. Presence of CME logo on distributed units and record through remote audit survey observation/10/. 2. Unique stove ID punched on each stove remote audit survey observation/39/. 3. Carbon right transfer through end user agreement/23/. <p>The CPAs have been implemented in line with the CPA DDs/2-4/.</p>
Findings	No findings were raised
Conclusion	<ol style="list-style-type: none"> a) The verification team is of the opinion that the physical features of the CPA have been implemented in accordance with the registered CPA-DDs/2-4/. b) No specific monitoring equipment had to be installed according to the monitoring plan. c) It is also confirmed, through the interview of the CME representatives and review of the supporting documentation that physical features of the component CPA have been implemented in accordance with the CPA-DDs/2-4/. d) The CPAs were also found to be completely operational in line with the CPA-DDs/2-4/. e) The information provided in the relevant sections of the monitoring report describes the implementation and operation status of the PoA f) The verification team confirms that the monitoring periods are consecutive.

E.3.2. Post-registration changes

E.3.2.1. Temporary deviations from the registered monitoring plan, applied methodologies, standardized baselines or other methodological regulatory documents

No deviations identified in the current verification and there exist no previously approved deviations for the CPAs under verification.

E.3.2.2. Corrections

N/A

E.3.2.3. Changes to the start-date of the crediting period

No changes to the start date of the crediting period.

E.3.2.4. Inclusion of a monitoring plan

N/A

E.3.2.5. Permanent changes to the registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines, or other methodological regulatory documents

N/A

E.3.2.6. Changes to the project design

N/A

E.3.2.7. Changes specific to afforestation and reforestation activities

N/A

E.3.3. Compliance of the registered monitoring plan with applied methodologies and standardized baselines

Means of verification	The monitoring plan as contained in CPA-DDs/2-4/ were reviewed against the monitoring requirements of the applied methodology AMS-II. G version 03 /6/ as well as PoA-DD/1/ with reference to the technology involved. Based on this review, it was found that the monitoring plan contained in the CPA DDs/2/ includes all the required parameters to be monitored in the context of the CPA design and description and allows proper determination of emission reductions in accordance with PoA DD/1/ and applied methodology AMS-II.G version 03/6/.
Findings	No findings were raised.
Conclusion	The monitoring plan is in line with the approved methodology AMS II.G Ver.3/6/, that is included in the CPA-DDs/2-4/.

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

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

Annual average biomass consumption per appliance, Tonnes/year, Q_{biomass}

Means of verification	The value of the parameter is fixed at CPA and has been calculated as per the applied methodology/6/. The value for firewood stoves and charcoal stoves is 5.01 and 5.52, respectively. It was checked from the CPA-DDs/2-4/.
Findings	No findings were raised.
Conclusion	The value in the monitoring report and corresponding emission reduction calculations spreadsheet/12/ are consistent with the CPA DDs/2-4/. The applied value is correct and justified.

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

Means of verification	The value of the parameter is fixed at the time of first CPA and has been calculated as per the data extracted from FAO and IPCC. The value of the parameter applied in the ER sheet is 0.93 which is consistent with the CPA-DDs/2-4/.
Findings	No findings were raised.
Conclusion	The value in the monitoring report and corresponding emission reduction calculations spreadsheet/12/ are consistent with the CPA-DDs/2-4/. The applied value is correct and justified.

Net calorific value of the non-renewable biomass that is substituted, TJ/tonne, $\text{NCV}_{\text{biomass}}$

Means of verification	The value of the parameter is 0.015 TJ/tonne which is a default value stated by the applied methodology/6/ and was checked from the CPA-DDs/2-4/.
Findings	No findings were raised.
Conclusion	The value in the monitoring report and corresponding emission reduction calculations spreadsheet/12/ are consistent with the CPA-DDs/2-4/. The applied value is correct and justified.

Emission factor for the substitution of non-renewable woody biomass by similar consumers, tCO_2/TJ , $\text{EF}_{\text{projected_fossilfuel}}$

Means of verification	The value of the parameter is 81.6 tCO_2/TJ which is a default value stated by the applied methodology/6/.and was checked from the CPA-DDs/2-4/.
Findings	No findings were raised.
Conclusion	The value in the monitoring report and corresponding emission reduction calculations spreadsheet/12/ are consistent with the CPA-DDs/2-4/. The applied value is correct and justified.

Efficiency of the system being replaced, Fraction, η_{old}

Means of verification	The value of the parameter is 0.106 which is a default value stated by the applied methodology/6/.and was checked from the CPA-DDs/2-4/ and ER calculation sheet/12/.
Findings	No findings were raised.
Conclusion	The value in the monitoring report and corresponding emission reduction

	calculations spreadsheet/12/ are consistent with the CPA-DDs/2-4/. The applied value is correct and justified.
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Net to gross adjustment factor to account for leakages, Fraction, LAF

Means of verification	The value of the parameter is 0.95 which is a default value sourced from the applied methodology/6/. The value was found to be consistent between the CPA-DDs/2-4/ and ER sheet/12/.
Findings	No findings were raised.
Conclusion	The value in the monitoring report and corresponding emission reduction calculations spreadsheet/12/ are consistent with the CPA-DDs/2-4/. The applied value is correct and justified.

E.3.4.2. Data and parameters monitored**Efficiency of the device being deployed as part of the project activity in year y, %, $\eta_{new,y}$**

Means of verification	Criteria/Requirements	Assessment/Observations
	Measuring /Reading /Recording frequency	Annually.
	Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes.
	Monitoring equipment	Yes. Moisture meter, Digital Thermometer and Weighing Scale. See section E.3.5. for the detailed assessment of calibration of monitoring equipment.
	How were the values in the monitoring report verified?	<p>The efficiency of the stoves deployed was as follows:</p> <p>i) Econofire- 28.99%</p> <p>ii) Econochar-32.60%</p> <p>iii) CH2200- 35.58%</p> <p>The efficiency has been calculated through the WBT test performed for sampled number of stoves. The sample size was determined following PoA sampling plan/1/. The WBT tests were performed on 29 stoves in all (10 stoves for Econofire, 10 Stove for CH2200 and 9 stoves for Econochar) as checked from the WBT sheet calculation sheet presented in the ER calculation sheet/12/.</p> <p>Additionally, during the remote audit survey, the verification team selected 22 samples, out of which 14 were the ICSs where WBT was conducted. The end users surveyed confirmed that their stove was picked up for WBT and another stove was given to them. The team was able to confirm the Unique serial IDs of both old and new stoves through observation of the stove and the end user agreement/23/.</p> <p>The values given in the ER sheet/12/ were checked with WBT sheets/35/ and found to be correct. The test has</p>

		met the required confidence and precision. The team confirms that the applied value is correct and justified.
	If applicable, has the reported data been cross-checked with other available data?	Yes. The efficiency values were cross-checked as stated in the ER calculation sheet with the WBT forms/35/.
	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	The CME has provided the training evidences/36/ and list of persons involved/29/ in conducting the WBT to confirm that QA/QC procedure are followed in line with the registered monitoring plan. Also, during the remote audit survey one of the WBT personnel was interviewed to confirm that the WBT tests are conducted in-line with the registered monitoring plan. Following questions were asked during the interview of the WBT Personnel: <ul style="list-style-type: none"> • Name of the person • Qualification of the WBT personnel • WBT procedure • Team Composition • WBT Training Procedure
	In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by Appendix 1 to the CDM Project Standard?	NA
Findings	CAR#02 was raised and resolved.	
Conclusion	The parameter has been monitored appropriately, in accordance with the registered monitoring plan/1/ (as per measurement methods and procedures to be applied) and applied methodology/6/. The monitoring results were recorded consistently as per the approved frequency in the monitoring plan/1/.	

Total number of stoves installed, Number, Nail

Means of verification	Criteria/Requirements	Assessment/Observations			
	Measuring /Reading /Recording frequency	Annually.			
	Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes.			
	Monitoring equipment	NA			
	How were the values in the monitoring report verified?	The values stated in the MR are as following:			
		Parameter	5342-P1-0007-	5342-P1-0008-	5342-P1-0009-

			CP1	CP1	CP1
		Nwood	974	748	430
		NCharcoal	3,026	3,252	2,906
		Nall	4,000	4,000	3,336
	<p>The parameter is recorded for each sale in the ICS database/5/.</p> <p>The CME also keeps end user agreement as installation evidence/23/.</p> <p>Each stove has Unique serial ID, which is mentioned in the ICS database and claims for ERs.</p> <p>No discrepancies were found in the observations recorded during the remote survey.</p> <p>The entries in the database were checked to confirm the total number presented in the MR/13/. 11 samples of each fuel type (i.e 11 charcoal based stoves and 11 wood based stove) i.e.total 22 ICSs) were remotely audited by the assessment team.</p>				
	If applicable, has the reported data been cross-checked with other available data?	Yes. Sampled number of entries (22) was checked with the installation invoices/26/.			
	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Representatives of the CME working the host country were interviewed to understand and confirm that the database management is done in line with the registered monitoring plan.			
	In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by Appendix 1 to the CDM Project Standard?	NA			
Findings	CAR#02 was raised and resolved.				
Conclusion	The parameter has been monitored appropriately, in accordance with the registered monitoring plan/1/ (as per measurement methods and procedures to be applied) and applied methodology/6/. The monitoring results were recorded consistently as per the approved frequency in the monitoring plan/1/.				

Stove Operation Fraction – used to determine the share of distributed stoves that are still operating, measured ex-post through sampling, Fraction, SOF

Means of verification	Criteria/Requirements	Assessment/Observations
	Measuring /Reading /Recording frequency	Annually.
	Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes.
	Monitoring equipment	NA
	How were the values in the monitoring report verified?	The values stated in the MR are as following: SOF _{charcoal} : 0.964

		<p>SOF_{wood}: 1.000</p> <p>This parameter is monitored ex-post through sampling. 127 Samples total were monitored by the CME.</p> <p>Based on the user survey data collected, the parameter was calculated and the values applied can be verified from the monitoring survey sheet/12/</p> <p>22 samples -11 charcoal based stoves and 11 wood based stove were remotely surveyed by the verification team during the Remote Survey to confirm the result presented in the survey sheet/11,12/.</p> <p>No discrepancies were found in the observations recorded during the remote survey.</p> <p>Thus, it can be confirmed that the applied value has been correctly determined and applied.</p>
	If applicable, has the reported data been cross-checked with other available data?	Yes. The results presented in the ER sheet/12/ were checked with monitoring survey forms/24/ and found to be have same information.
	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes
	In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by Appendix 1 to the CDM Project Standard?	NA
Findings	CAR#02 was raised and resolved.	
Conclusion	The parameter has been monitored appropriately, in accordance with the registered monitoring plan/1/ (as per measurement methods and procedures to be applied) and applied methodology/6/. The monitoring results were recorded consistently as per the approved frequency in the monitoring plan/1/.	

Fraction of end users that are still using baseline stoves, Fraction, f_{old}

Means verification of	Criteria/Requirements	Assessment/Observations
	Measuring /Reading /Recording frequency	Annually.
	Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes.
	Monitoring equipment	NA
	How were the values in the monitoring report verified?	<p>The parameter is determined through survey and applying a simple formula to survey result:</p> <p>$f_{old} = 1 - f_{non-old}$ (people not using old stove/total envirofit stove users)</p>

		<p>The values obtained in the ER sheet/11,12/ and the MR/13/ are as following:</p> <p>$f_{old_charcoal}$: 0.000</p> <p>f_{old_wood}: 0.295</p> <p>For survey 80 samples for f_{old} charcoal and 44 samples for f_{old} woodfuel (total 124) were monitored by the CME.</p> <p>Thus, parameter is calculated through monitoring of users not using baseline stoves (f_{nonold}) as stated in the CPA-DD/2-4/.</p> <p>Based on the end user survey the parameter was calculated and the values applied can be verified from the monitoring survey summary presented in the ER sheet/11,12/</p> <p>22 samples (11 of each fuel type-charcoal or wood) were surveyed by the verification team during the remote audit survey to confirm the result presented in the survey sheet/12/.</p> <p>No discrepancies were found in the observations recorded during the remote survey.</p> <p>For, charcoal stoves, the value of the parameter applied is 0. This has happened because all the households selected for monitoring have reported not to be using the baseline stove. This can happen as not all end users use baseline stove after receiving the project stove. The percentage of end users still using the baseline stove can vary from 0%-100%. The monitoring forms and interviewed people confirmed the applied value.</p> <p>Thus, it can be confirmed that the applied value has been correctly determined and applied.</p>
	If applicable, has the reported data been cross-checked with other available data?	Yes. The results presented in the ER sheet/12/ were checked with monitoring survey forms/24/ and found to have the same information.
	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes
	In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by Appendix 1 to the CDM Project Standard?	NA
Findings	CL#01 and CAR#02 was raised and resolved.	
Conclusion	The parameter has been monitored appropriately, in accordance with the registered	

	monitoring plan/1/ (as per measurement methods and procedures to be applied) and applied methodology/6/. The monitoring results were recorded consistently as per the approved frequency in the monitoring plan/1/.
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The amount of woody biomass consumption that is consumed through the continued use of old stoves, kg/year, μ old

Means of verification	Criteria/Requirements	Assessment/Observations
	Measuring /Reading /Recording frequency	Annually.
	Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes.
	Monitoring equipment	NA
	How were the values in the monitoring report verified?	<p>The parameter is determined through survey and applying following formula to survey result:</p> $U_{old} = (MPM_{after\ ICS} / MPM_{before\ ICS} * \text{Total annual fuel consumption(kg)})$ <p>During the survey, the end users are asked for the number of meals they prepare on baseline stove and on project stove to calculate the value of MPM before and after ICS use.</p> <p>The values obtained in the ER sheet/11,12/ and the MR/13/ are as following:</p> <p>$\mu_{old_charcoal}$: 0</p> <p>μ_{old_wood}: 1,566</p> <p>Based on the end user survey the parameter was calculated and the values applied can be verified from the monitoring survey summary presented in the ER sheet/11,12/</p> <p>8 samples (fuel type- wood) were surveyed by the verification team during the remote audit survey to confirm the result presented in the survey sheet/11,12/.</p> <p>No discrepancies were found in the observations recorded during the remote survey.</p> <p>For, charcoal stoves, the value of the parameter applied is 0. The parameter is 0 because fold (fraction of end users still using baseline stove is zero). This has happened because all the households selected for monitoring have reported not to be using the baseline stove. This can happen as not all end users use baseline stove after receiving the project stove. The percentage of end users still using the baseline stove can vary from 0%-100%. The monitoring forms and interviewed people confirmed the</p>

		<p>applied value.</p> <p>Thus, it can be confirmed that the applied value has been correctly determined and applied.</p>
	If applicable, has the reported data been cross-checked with other available data?	Yes. The results presented in the ER sheet/12/ were checked with monitoring survey forms/24/ and found to have the same information.
	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes
	In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by Appendix 1 to the CDM Project Standard?	NA
Findings	CL#01 and CAR#02 were raised and resolved.	
Conclusion	The parameter has been monitored appropriately, in accordance with the registered monitoring plan/1/ (as per measurement methods and procedures to be applied) and applied methodology/6/. The monitoring results were recorded consistently as per the approved frequency in the monitoring plan/1/.	

Calculated average stove operation years in the monitoring period. If stoves have been operating for 365 days, then $\text{Stove}_{\text{year}} = 1.0$. If less than 365 days, then $\text{Stove}_{\text{year}}$ is represented as a fraction of 365 (eg. 180 days= 0.5), Year, $\text{Stove}_{\text{year}}$

Means of verification	Criteria/Requirements	Assessment/Observations														
	Measuring /Reading /Recording frequency	Annually.														
	Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes.														
	Monitoring equipment	NA														
	How were the values in the monitoring report verified?	<p>The parameter is calculated for all the stoves disseminated under the CPAs by considering their date of installation and calculating the total number of days for which they operated in the current monitoring period.</p> <p>The values obtained in the ER sheet/11,12/ and the MR/13/ are as following:</p> <table><tr><td>Parameter</td><td>5342-P1-0007-CP1</td><td>5342-P1-0008-CP1</td><td>5342-P1-0009-CP1</td></tr><tr><td>STOVE_{yearwood}</td><td>0.75</td><td>0.73</td><td>0.72</td></tr><tr><td>STOVE_{yearcharcoal}</td><td>0.68</td><td>0.61</td><td>0.46</td></tr></table> <p>The above values were checked in the ER sheet/12/ for the calculation and found to be correct.</p> <p>The total stoves considered for calculating</p>				Parameter	5342-P1-0007-CP1	5342-P1-0008-CP1	5342-P1-0009-CP1	STOVE _{yearwood}	0.75	0.73	0.72	STOVE _{yearcharcoal}	0.68	0.61
Parameter	5342-P1-0007-CP1	5342-P1-0008-CP1	5342-P1-0009-CP1													
STOVE _{yearwood}	0.75	0.73	0.72													
STOVE _{yearcharcoal}	0.68	0.61	0.46													

		average values of stove year in the ER sheet/12/ are the same as the number of stoves listed in the ICS database/5/.
	If applicable, has the reported data been cross-checked with other available data?	Yes. The entries in the ICS database/5/ were checked with end user agreement/23/ and through the interview of the end-users during the remote audit survey.
	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes
	In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by Appendix 1 to the CDM Project Standard?	NA
Findings	CAR#02 was raised and resolved.	
Conclusion	The parameter has been monitored appropriately, in accordance with the registered monitoring plan/1/ (as per measurement methods and procedures to be applied) and applied methodology/6/. The monitoring results were recorded consistently as per the approved frequency in the monitoring plan/1/.	

E.3.4.3. Implementation of sampling plan

Means of verification	<p>The monitoring has been carried out in accordance with the monitoring plan contained in the revised approved PoA DD/1/ and CPA DDs/2-4/.</p> <p>Sampling Design/Target Population/Sampling Frame/Reliability:</p> <p>The CME has applied single sampling plan for all the 3 CPAs. According to the 'Sampling and Survey standards,' version 8.0/15/, the sampling plan applied by the CME for the concerned CPAs are found to be appropriate. As per the sampling plan stated in the PoA DD/1/, a minimum 95% confidence interval and a 10% margin of error requirement is achieved for the sampled parameters whenever cross-sampling takes place. The CME has followed a frequency of annual monitoring. Since the sampling has been done across the CPAs, the CME has taken 95/10 as the confidence precision levels which is found to be in line with the registered monitoring plan/1,2-4/.</p> <p>The target population for the parameters stated above are ICS installed and recorded in the project ICS database/5/.</p> <p>Sampling Frame:</p> <p>All the stoves are homogeneous for their location, target population except for fuel type. However, there are two different type of ICS used by the end users under the CPAs: Wood based ICS (Econofire stoves) and charcoal based ICS (Econochar stoves and CH2200). Therefore, wood stoves-Econofire and charcoal stove-Econochar/CH2200 have been considered in different sampling frames.</p> <p>Sampling Method and selection:</p> <p>The samples have been chosen randomly from both the fuel types for parameters SOF, fold and μ_{old}. For stove efficiency parameter the samples were randomly chosen from each of the stove models as checked from screenshots of online random number generator/37/.</p> <p>Sample Size for Parameter of Interest:</p> <p>The sampling is applied to the following monitoring parameters:</p> <ul style="list-style-type: none"> The thermal efficiency of the ICS distributed (%), $\eta_{new,y}$
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	<ul style="list-style-type: none"> • The Stove Operating Fraction, i.e. the fraction of users using the ICS, SOF • The fraction of stove users still using baseline (replaced) stoves, f_{old} • The amount of woody biomass that continues to be used in the replaced stoves (kg), μ_{old} <p>The sample size is chosen using the equation inline to CDM guidelines for Sampling and surveys for CDM project activities and programmes of activities version 4.0/14/.</p> <p>In this regard, sample size calculation spreadsheet /12/ was checked and found correct as per registered monitoring plan. The complete details are given in section E.3 of Monitoring Report/13/.</p> <p>Implementation of Sampling Survey and Field Test Records:</p> <p>Besides interviewing the CME, sampled HHs and surveyors during the Remote Audit Survey, the verification team also checked the training records of the personnel conducting monitoring surveys and tests/36/. The verification team also interviewed the personnel involved in the monitoring during the remote audit survey. Therefore, the implementation of surveys and tests was considered reliable.</p> <p>Monitoring survey (by CME) duration:</p> <p>The monitoring surveys were conducted from 20/04/2020 to 05/05/2020 and WBT tests were conducted from, 01/05/2020 to 11/05/2020.</p> <p>Reliability and precision calculation:</p> <p>The verification team has verified the ER calculation spreadsheets /12/ with the monitored data, where the actual achieved precision is calculated against the Guidelines outlined under "Standard for sampling and surveys for CDM project activities and Programme of Activities" v8.0 /15/ and confirms that the calculation of achieved reliability was done correctly.</p> <p>All parameters of interest are included in the ER spreadsheet for the CPAs. These were checked for the input values as well as formula applied and were found consistent. The reliability (demonstration of precision achieved after the survey results) is depicted in the ER calculation sheets /12/ corresponding to final Monitoring Report /13/, which were also found correct.</p> <p>Thus, the verification team confirms that required precision has been met and the results are reliable.</p>
Findings	CL#02 was raised and resolved.
Conclusion	The verification team has found out that the sampling plan applied is found to be in-line with the monitoring plan mentioned in the registered PoA-DD/1/ and CPA-DDs/2-4/ and Sampling and survey standards, ver.8.0/15/

E.3.5. Compliance with the calibration frequency requirements for measuring instruments

Means of verification	The monitoring plan (included in CPA DDs/2-4/ and registered PoA DD/1/) does not state the calibration requirements for any of the parameter. However, the verification team has checked if the monitoring equipment used during WBT test (mass balance, moisture meter and thermometer) were duly calibrated. As a result, the following information was verified from the calibration certificate/26/ of the equipment used for thermal efficiency test;				
	Equipment	Sr. No.	Name of Manufacturer	Name of Model	Measuring range - Accuracy
	Digital Thermometer	141203661	Omega	Omegatette HH308 Type K	-200°C to 1370°C +/-0.3%
	Weighing Balance	NA	My Weigh	Standard Test Weight	0.0 g to 5000g 0.3g

	Digital Thermometer	141203662	Omega	Omegatette HH308 Type K	-200°C to 1370°C	+/-0.3%
	Digital Thermometer	130803109	Omega	Omegatette HH308 Type K	-200°C to 1370°C	+/-0.3%
	Moisture Meter	3510207500	Trotec	T500	15 to 100 digits (for material moisture) 5% to 50% (for wood moisture)	+/-1%
<p>The calibration date of all the above-mentioned equipment (except moisture meter which is auto calibrated) was 19/07/2019 and the recalibration date was found to be 18/07/2020 /26/, /37/. So, from the calibration certificate, it was ensured that the tests have been conducted with the calibrated instrument. The WBTs were done during 01/05/2020 to 11/05/2020 /35/.</p> <p>In absence of manufacturer mentioned any specific validity of the calibration, the “General Guidelines to SSC CDM methodologies” is applied. As per the guidelines as per “General Guidelines to SSC CDM methodologies” EB 61, Annex 21/31/, para 17 (c): “Measuring equipment should be certified to national or IEC standards and calibrated according to the national standards and reference points or IEC standards and recalibrated at appropriate intervals according to manufacturer specifications, but at least once in three years”. Hence, the instrument can be considered calibrated until three years from the date of purchase.</p>						
Findings	No findings were raised.					
Conclusion	The verification team confirm that CME applied good practices (as per manufacturer recommendation) while using the monitoring equipment and these were under the state of calibration. There is no specific requirement prescribed in this regard in the registered monitoring plan/01/ and in monitoring methodology/6/. Therefore, the approach presented by CME was accepted.					

E.3.6. Assessment of data and calculation of emission reductions or net removals

E.3.6.1. Calculation of baseline GHG emissions or baseline net GHG removals by sinks

Means of verification	The following equations were used to determine the baseline emissions as provided in the monitoring report /13/ and applied in the corresponding ER calculations sheet /12/. The expressions used were found consistent with the PoA DD /1/, CPA DDs /2-4/ and the applied methodology AMSII.G, version 03 /6/:	
	$ER_y = B_{y,savings} \cdot f_{NRB} \cdot NCV_{biomass} \cdot EF_{projected\ fossilfuel}$	
	Where:	
	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_{nr}	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
	$B_{y,savings} = B_{old} \cdot \left(1 - \frac{\eta_{old}}{\eta_{new}} \right)$	
	B_{old}	Quantity of woody biomass used in the absence of the project activity in tonnes.

	η_{old}	Efficiency of system being replaced
	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.
$B_{old} = LAF \cdot N_{all} \cdot SOF \cdot (Q_{biomass} - \left(\frac{\mu_{old}}{1000} \cdot f_{old} \right)) \cdot Stove_{year}$ <p>E.1. Where,</p> <p>E.2. B_{old} : Quantity of woody biomass used in the absence of the project activity in tonnes.</p> <p>E.3. LAF : Net leakage adjustment factor</p> <p>The effective duration of monitoring period is from 01/072019 to 31/03/2020. Thus CME has claimed the ERs only from 01/072019 to 31/03/2020.</p> <p>The verification team has checked that the calculation for the 3 CPAs (CPA 010(5342-P1-0007-CP1), CPA 011(5342-P1-0008-CP1) and CPA 012(5342-P1-0009-CP1)) have been done correctly in the worksheet 'ERs Summary' /12/.</p> <p>The calculations for all the CPAs were checked in the ER sheet/12/ and it was found that calculations have been done inline to the PoA DD/01/ and in accordance with the applied methodology/6/. The ex-ante values applied were also found to be consistently applied in line with the PoA and the CPA DDs/2-4/</p> <p>All the parameters are assessed in detail under section E.3.4. of this report.</p>		
Findings	No finding was raised.	
Conclusion	<p>The verification team confirms that</p> <ol style="list-style-type: none"> The complete data was available and is duly reported. As indicated above, the description with regard to cross-check of reported data is included under respective parameter above. Appropriate methods and formulae for calculating baseline GHG emissions or baseline net GHG removals were followed. Appropriate emission factors, IPCC default factors and other reference values were correctly applied. There is no pro-rata approach applied in the current monitoring period as entire monitoring period falls into period that is after the end of first commitment period of Kyoto Protocol. 	

E.3.6.2. Calculation of project GHG emissions or actual net GHG removals by sinks

Means of verification	As per applied methodology/6/, single equation is provided for the emission reduction calculation without any separate calculations for baseline emissions, project emissions or leakages related to the project. Hence, PE is not applicable in this case.
Findings	No findings were raised.
Conclusion	Project emission is not applicable, and the approach is in-line with the applied methodology.

E.3.6.3. Calculation of leakage GHG emissions

Means of verification	As per applied methodology/6/, single equation is provided for the emission reduction calculation without any separate calculations for baseline emissions, project emissions or leakages related to the project. 0.95 is applied as gross to net leakage adjustment factor to the ER calculation as per methodology.
Findings	No findings were raised.
Conclusion	The leakages could not be calculated, and the approach is in-line with the applied methodology.

E.3.6.4. Summary of calculation of GHG emission reductions or net GHG removals by sinks

Means of verification	<p>As elaborated above, the entire emission reductions from the PoA were based on the baseline emissions. The calculations presented in this regard in the monitoring report /13/ and the corresponding ER sheet /12/ were found appropriate and complying with provisions prescribed in the registered monitoring plan/1/ of the respective CPA-DDs/2-4/, PoA-DD/1/ and applied methodology/6/</p> <p>The verification team affirms that an audit trail that contains the evidence and records that validated the stated figures were checked and found legitimate.</p>
Findings	CAR#01 has been raised and resolved.
Conclusion	<p>The verification team confirms that:</p> <ul style="list-style-type: none"> a) The complete data was available and is duly reported. b) As indicated above, the description with regard to cross-check of reported data is included under the respective parameter (refer Section E.3.4.2 of this report). c) Appropriate methods and formulae for calculating baseline GHG emissions or baseline net GHG removals, project emissions and leakage emissions were followed. d) Appropriate emission factors, IPCC default factors and other reference values were correctly applied. e) There is no pro-rate approach was applied in the current monitoring period as the entire monitoring period falls into a period that is after the end of the first commitment period of Kyoto Protocol. f) The total number of ERs achieved during the current monitoring period is 26,164 tCO₂e.

Title and UNFCCC reference number of the CPA	Baseline emissions or baseline net GHG removals by sinks (tCO ₂ e)	Project emissions or actual net GHG removals by sinks (tCO ₂ e)	Leakage (tCO ₂ e)	GHG emission reductions or net GHG removals by sinks (tCO ₂ e)		
				Amount achieved before 1 January 2013	Amount achieved from 1 January 2013	Amount achieved in the entire monitoring period
African Improved Cooking Stoves Programme of Activities CPA 00010 (Nigeria) supported by Republic of Korea Version: 4.0 Ref: 5342-P1-0007CP1	10,302	0	0	0	10,302	10,302
African Improved Cooking Stoves Programme of Activities CPA 00011 (Nigeria) supported by Republic of Korea Version: 4.0 Ref: 5342-P1-0008-CP1	9,604	0	0	0	9,604	9,604
African Improved Cooking Stoves Programme of Activities CPA 00012 (Nigeria) supported by Republic of Korea Version: 4.0 Ref: 5342-P1-0009-CP1	6,258	0	0	0	6,258	6,258
Total	26,164	00	00	00	26,164	26,164

E.3.6.5. Comparison of actual GHG emission reductions or net GHG removals by sinks with estimates in included CPA

Means of verification	<p>Earthood Services Private Limited can certify that the emission reductions from the CDM project activity 5342 "African Improved Cooking Stoves Programme of Activities" in Nigeria for the monitoring period 01/07/2019-31/03/2020 (including both days) amount to 26,164tCO₂. The achieved and estimated ERs are presented in the next table. The achieved ERs are lower as compared to the estimated ERs due to lesser number of installations done under each CPA. Since the achieved ERs are lower than the estimated, no further justification was sought.</p> <p>Verified and certified emission reductions as per commitment period:</p> <table> <tr> <th>Commitment period</th><th>Amount</th></tr> <tr> <td>Up to 31/12/2012 (1st commitment period)</td><td>0 tCO₂e</td></tr> <tr> <td>From 01/01/2013</td><td>26,164 tCO₂</td></tr> </table>	Commitment period	Amount	Up to 31/12/2012 (1 st commitment period)	0 tCO ₂ e	From 01/01/2013	26,164 tCO ₂
Commitment period	Amount						
Up to 31/12/2012 (1 st commitment period)	0 tCO ₂ e						
From 01/01/2013	26,164 tCO ₂						
Findings	No findings were raised.						
Conclusion	The actual ERs achieved in included CPAs are not higher than the estimated quantity of ERs in the CPA-DDs/2-4/. Accordingly, it was accepted by the verification team.						

Title and UNFCCC reference number of the CPA	Actual values achieved by the CPAs during this monitoring period	Value estimated in ex ante calculation in the included CPA-DD(s)
5342-P1-0007-CP1	10,302	33,095
5342-P1-0008-CP1	9,604	33,095
5342-P1-0009-CP1	6,258	33,095
Total	26,164	99,285

E.3.6.6. Remarks on difference from estimated value in included CPA

Means of verification	<p>As verified and evident from the Monitoring Report /13/ and corresponding ER calculations sheet /12/, the actual emission reductions achieved for Improved Cookstoves for the CPAs under this verification in the current monitoring period were found less than the estimated quantity in the CPA-DDs/2-4/ for the comparable period.</p> <p>The lower number of ERs are due to a smaller number of installations done under the CPAs as compared to estimated distribution number. Considering that there is no increase in ERs no further verification effort was put in. The details of actual values of achieved ERs for the CPA and value estimated in the CPA- DDs/2-4/ is presented in the table above.</p>
Findings	No findings were raised.
Conclusion	The actual emission reductions achieved in any of specific CPAs are not higher than the estimated quantity of ERs in the CPA-DDs/2-4/. Accordingly, it was accepted by the verification team.

E.3.7. Assessment of reported sustainable development co-benefits

Means of verification	The coordinating/managing entity did not identify and establish the monitoring of the sustainable development benefits of the registered CDM PoA/1/ and no such document was developed and published on the UNFCCC CDM website/25/. Therefore, no assessment is required.
Findings	No findings were raised.
Conclusion	The CME is not required to monitor the sustainable development benefits of the registered CDM PoA.

E.3.8. Global stakeholder consultation

Means of verification	The global stakeholder consultation was not found applicable because period under verification is seventh monitoring period.
Findings	No findings were raised.
Conclusion	The requirement is applicable for situations when global stakeholder consultation

	was carried out after the publication of first monitoring report. Therefore, this was not found applicable
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SECTION F. Internal quality control

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

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

SECTION G. Verification opinion

Earthood Services Private Limited (ESPL), contracted by Envirofit (the CME for the PoA), has performed the independent verification of the emission reductions for the registered CDM PoA 5342 "African Improved Cooking Stoves Programme of Activities" for the seventh monitoring period 01/07/2019-31/03/2020 (both days included) as reported in the Monitoring Report (public) Version 1.0 dated 16/05/2020. The CME is responsible for the collection of data in accordance with the monitoring plan and the reporting of GHG emissions reductions from the project activity.

This verification report is for the PoA-5342 which involves the verification of CPAs (5342-P1-0007-CP1 to 5342-P1-0009-CP1) that has been included in the PoA before the end of the current monitoring period.

ESPL confirms that the monitoring system is in place and the emission reductions are calculated without material misstatements. This verification report has been prepared using the latest available template specified by UNFCCC and complies with the instructions to follow of CDM VVS-PoA Version 02.

The verification activities were conducted in accordance with ESPL's CDM Quality Manual System as per the steps indicated under Section A of this report. The verification process has resulted in conclusion that the included CPAs confirm to the revised accepted PoA-DD as well as comply with applicable CDM rules and regulations and in accordance with applied monitoring methodologies, AMS II.G (Version 03).

As a result, it is confirmed that the emission reductions from the CDM PoA 5342 "African Improved Cooking Stoves Programme of Activities" are correctly reported in the Monitoring Report Version 3.0 dated 15/08/2020 and corresponding ER sheets for the monitoring period 01/07/2019-31/03/2020 (including both days) amount as 26,164 tCO₂e. Therefore, this will be submitted as part of request for issuance as per CDM PCP Version 02.

SECTION H. Certification statement

Earthood Services Private Limited (ESPL), contracted by Envirofit (the CME for the PoA), has performed the independent verification of the emission reductions for the registered CDM PoA 5342 "African Improved Cooking Stoves Programme of Activities" in Nigeria for the seventh monitoring period 01/07/2019-31/03/2020 (both days included) as reported in the Monitoring Report (final) Version 3.0 dated 15/08/2020.

The verification is based on the registered PoA-DD, CPA-DDs and the monitoring report for this project. ESPL's verification approach was based on the requirements as defined under the Kyoto Protocol, Marrakech accord, as well as those defined by the CDM Executive Board.

The management of the Envirofit International Ltd. is responsible for the preparation of the GHG emissions data and the reported GHG emissions reductions as set out in the project Final Monitoring Report Version 3.0 dated 15/08/2020. The calculation and determination of GHG emission reductions from the project is the responsibility of the management of Envirofit International Ltd. The development and maintenance of records and reporting procedures are in accordance with the Monitoring Report Version 3.0 dated 15/08/2020.

It is our responsibility to express an independent GHG verification opinion on the GHG emissions and on the calculation of GHG emission reductions from the project for the monitoring period 01/07/2019-31/03/2020

(including both dates) based on the reported emission reductions in the Final Monitoring Report Version 3.0 dated 15/08/2020 for the same period.

Based on an understanding of the risks associated with reporting GHG emissions data and the controls in place to mitigate these, ESPL planned and performed our work to obtain the information and explanations that we considered necessary to provide sufficient evidence for us to give reasonable assurance that this reported amount of GHG emission reductions for the period is fairly stated.

ESPL confirms the following;

Monitoring period: From 01/07/2019 up to 31/03/2020 (including both dates)

Verified and certified emission in the above monitoring period:

	Amount	Unit
Certified emission reductions (CERs)	26,164	tCO ₂ e

Appendix 1. Abbreviations

Abbreviations	Full texts
AQL	Acceptable Quality Level
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CDM PCP	Clean Development Mechanism Project Cycle Procedure
CDM PS	Clean Development Mechanism Project Standard
CDM VVS	Clean Development Mechanism Validation and Verification Standard
CER	Certified Emission Reduction
CL	Clarification Request
CME	Coordinating or Managing Entity
CPA	Component Project Activity
CP	Crediting period
DOE	Designated Operational Entity
DNA	Designated National Authority
EB	Executive Board
ESPL	Earthhood Services Private Limited
FAR	Forward action request
GHG	Green House Gases
GS	Gold standard
ICS	Improve Cook Stoves
IPCC	Intergovernmental Panel on Climate change
POA	Programme Of Activity
PO	Partner Organization
PSU	Primary Sampling Unit.
TA	Technical Area
TR	Technical Reviewer
VVS	Validation and Verification Standard
UNFCCC	United Nation Framework convention on Climate change
WBT	Water Boiling Test

Appendix 2. Competence of team members and technical reviewers

Competence Statement	
Name	Deepika Mahala
Country	India
Education	M. Sc. (Environmental Management), GGSIP University B.Sc. Hons. (Chemistry), Sri Venkateshwar College, DU
Experience	3 Years +
Field	Climate Change
Approved Roles	
Team Leader	YES
Validator	YES
Verifier	YES
Methodology Expert	ACM0002, AMS.I.D., AMS.I.A, AMS.III.AV, AMS.II.G
Local expert	YES (India)
Financial Expert	NO

Technical Reviewer	YES		
TA Expert	YES (TA 1.2 & TA 3.1)		
Reviewed by	Shreya Garg	Date	14/09/2018
Approved by	Anshika Gupta	Date	14/09/2018

Competence Statement			
Name	Vaishali Vatsa		
Education	M.Sc. (Environmental Studies and Resource Management), TERI University		
Experience	4 months		
Field	Climate Change		
Approved Roles			
Team Leader	NO		
Validator	Yes		
Verifier	Yes		
Methodology Expert	NO		
Local expert	NO		
Financial Expert	NO		
Technical Reviewer	NO		
TA Expert (X.X)	NO		
Trainee	NO		
Reviewed by	Shreya Garg	Date	30/12/2019
Approved by	Anshika Gupta	Date	02/01/2020

Competence Statement			
Name	Ashok Gautam		
Country	India		
Education	M. Sc. (Environmental Sciences) M. Tech. (Energy & Environmental Management)		
Experience	16 Years +		
Field	Energy, Climate Change & Environment		
Approved Roles			
Team Leader	YES		
Validator	YES		
Verifier	YES		
Methodology Expert	AMS-I.D., AMS-I.A., AMS-I.C., AMS-I.E, AMS-II.D., AMS-II.G., AMS-III.E., AMS-III.H., AMS-III.Q, AMS-III.Z., AMS-III.AV., AMS III.AR, AM0029, AM0025, AM0056, ACM0001, ACM0002, ACM0004, ACM0012, ACM0006, AM0018, ACM0009, AM0034, AMS.I.B, ACM0003		
Local expert	YES (India)		
Financial Expert	YES		
Technical Reviewer	YES		
TA Expert	YES (TA 1.1, TA 1.2, TA 3.1, TA 13.1)		
Reviewed by	Shreya Garg	Date	25/05/2020
Approved by	Kaviraj Singh	Date	25/05/2020

Competence Statement			
Name	Kumden Nanbal Luka		
Country	Nigeria		
Education	B.tech. in Urban and Regional Planning		
Experience	1+ years		
Field	Environment; Urban-Rural planning		
Approved Roles			
Team Leader	No		
Validator	No		
Verifier	No		
Methodology Expert	No		
Local expert	Yes (Nigeria)		
Financial Expert	No		
Technical Reviewer	No		
TA Expert	No		
Reviewed by	Shreya Garg	Date	23/11/2018
Approved by	Anshika Gupta	Date	23/11/2018

Appendix 3. Documents reviewed or referenced

No.	Author	Title	References to the document	Provider
1	Envirofit International Ltd	Registered PoA-DD Revised accepted PoA DD	Version 3.2, dated 27/11/2012 Version 4.3 Dated:07/06/2014	Others
2	Envirofit International Ltd	Registered CPA-DD-00010 (5342-P1-0007-CP1)	Version 4.0 Dated:29/03/2019	Others
3	Envirofit International Ltd	Registered CPA-DD-00011 (5342-P1-0008-CP1)	Version 4.0 Dated:29/03/2019	Others
4	Envirofit International Ltd	Registered CPA-DD-00012 (5342-P1-0009-CP1)	Version 4.0 Dated:29/03/2019	Others
5	Envirofit International Ltd	ICS Database	-	CME
6	UNFCCC	AMS-II.G: Energy efficiency measures in thermal applications of non-renewable biomass	Version 3.0	Others
7	UNFCCC	Project Standard for PoA (PS)	Version 2.0	Others
8	UNFCCC	Project Cycle Procedure for PoA (PCP)	Version 2.0	Others
9	UNFCCC	Validation and Verification Standard for PoA (VVS)	Version 2.0	Others
10	ESPL	Remote Audit assessment files (survey sheets)	22/06/2020-23/06/2020	Others
11	Envirofit International Ltd	Usage and Monitoring survey data (presented in the ER sheet)	16/07/2020 Version 2.1	CME
12	Envirofit International	ER calculation sheet	16/07/2020	CME

CDM-PoA-VCR-FORM

	Ltd		Version 2.1	
13	Envirofit International Ltd	Monitoring Report (published) Monitoring Report (final)	Version 1.0 Dated 16/05/2020 Version 3.0 Dated:15/08/2020	CME
14	UNFCCC	Guidelines for Sampling and Surveys for CDM project activities and Programme of activities	version 4.0	Others
15	UNFCCC	Standards for Sampling and Surveys for CDM project activities and programme of activities	Version 8.0	Others
16	Carbon Check	PoA PRC Validation opinion	Version 2.0 Dated 28/02/2014	Others
17	UNFCCC	CDM Monitoring Form for PoA (CDM-PoA-MR-FORM)	Version 3.0	Others
18	Envirofit International Ltd	CME and CPA implementer agreement	01/11/2018	CME
19	Envirofit International Ltd	Stove specification	-	CME
20	Envirofit International Ltd	Training manual for monitoring	-	CME
21	Envirofit International Ltd	CPA start date evidence -date of first shipment of ICS	05/11/2018	CME
22	Germanischer Lloyd Certification GmbH	PoA Validation report	Version 11, Dated 15/12/2012	Others
23	Envirofit International Limited	End User Agreement	Various	CME
24	Envirofit International Limited	Monitoring Survey forms/Records	20/04/2020-05/05/2020	CME
25	UNFCCC	PoA Link: https://cdm.unfccc.int/ProgrammeOfActivities/poa_db/4R62VM8H3CFJDZTAXYQEL7119NBPWO/viewCPAs	-	Others
26	Envirofit International Limited	Installation Invoices	Various	CME
27	Carbon Check India Private Limited	Inclusion report for CPA 010(5342-P1-0007-CP1), CPA 011(5342-P1-0008-CP1) and CPA 012(5342-P1-0009-CP1)	Version 4.0 31/03/2019	Others
28	GACC	EPTP Protocol-GACC	-	CME
29	Envirofit	List of persons involved in WBT	-	CME
30	The Dukes Engineering	Monitoring Equipment Purchase Invoice	01/08/2019	CME
31	UNFCCC	General Guidelines to SSC CDM methodologies EB 61, annex 21	-	Others
32	Envirofit International Ltd	WBT efficiency calculator	-	CME
33	Envirofit International Ltd	Stove test pictures	-	CME
34	Envirofit International Ltd	Equipment pictures	-	CME
35	Envirofit International Ltd	WBT Forms/Records	01/05/2020-11/05/2020	CME
36	Envirofit International Ltd	WBT training certificates	-	CME
37	Envirofit International Ltd	Screenshot of random number generated for sampling	-	CME

38	Envirofit International Ltd	Complaint Log (Scanned Samples)	-	CME
39	Envirofit International Ltd	Photographs of ICSs	-	
40	Envirofit International Ltd	Installed ICSs with Unique Product IDs	-	
41	Envirofit International Ltd	ERPA	-	
42	worldometers	https://www.worldometers.info/coronavirus/worldwide-graphs/	-	Other
43	BBC News	Coronavirus: Tracking the global Outbreak https://www.bbc.com/news/world-51235105	-	Other
44	Bureau of Immigration	Advisory: Travel and Visa restrictions	30/05/2020	Other
45	ESPL	Verification report for MP6	Version 2.0 Dated 27/11/2019	Others
46	Miracle Ayomikun Adesina	https://www.ejeph.com/download/mental-health-and-conflict-in-nigeria-an-overview-7806.pdf	2020	Others
47	Department of State-USA	https://travel.state.gov/content/travel/en/traveladvisories/traveladvisories/nigeria-travel-advisory.html	-	Others
48	Latlong	https://www.latlong.net/c/?lat=9.081999&long=8.675277	-	Others
49	Economic times	https://economictimes.indiatimes.com/industry/transportation/airlines/-aviation/suspension-of-international-flights-from-india-extended-till-31st-august-says-dgca/videoshow/77302326.cms	01/08/2020	Other

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

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

FAR ID	NA	Section no.	-	Date: DD/MM/YYYY
Description of FAR				
No FAR from previous verification				
CME response				Date: DD/MM/YYYY
NA				
Documentation provided by the CME				
NA				
DOE assessment				Date: DD/MM/YYYY
NA				

Table 2. CLs from this verification

CL ID	01	Section no.	E.3.4.2	Date : 15/08/2020
Description of CL				

1. For parameter μ_{old} Charcoal, Why the required sample size was not monitored? Around 83 samples were done for Charcoal ICS for parameter SOF. CME shall clarify.
2. For parameter f_{old} Charcoal, the value for charcoal has dropped down to 0 and on other hand for wood it is increased little less than three times as compared to previous monitoring survey.

Project participant response**Date: 15/08/2020**

1. μ_{old} is used to determine the usage of baseline stove along with ICS, if applicable, for discounting B_{old} in line with para 20(b) of methodology AMS II.G. version 3.0. This parameter is to be monitored only when the sampled users are found using baseline stoves along with ICS. In case of charcoal stoves all samples monitored were found using ICS only and no sample was found using baseline stove along with ICS (i.e. $f_{old} = 0$). Hence the parameter μ_{old} is not relevant for the concerned monitoring period and need not be monitored. Initially the sample size for μ_{old} was calculated based on an initial assumption of f_{old} as 10% (i.e. 10% pf users might be using baseline stove and ICS together). However, as the monitoring revealed that simultaneous baseline stove users do not exist (with f_{old} being 0.0), the parameter is redundant for the concerned monitoring period.
2. The achieved value for f_{old} Charcoal is purely based on monitoring results and is deemed outside the control of CME on account of random sampling. Also, in Nigeria the simultaneous use of baseline charcoal stove along with project charcoal stove is found scarcely. In MP4, a similar situation was encountered when the f_{old} Charcoal was found to be 0.0

f_{old} Wood has increased to less than 2 times the value monitored in MP6. In MP6 the f_{old} Wood = 11.9% and in MP7 the f_{old} Wood = 18.2% which is ~50% increase from value established in MP6. However, in MP7, the desired precision has not been met hence the final value applied is upper bound value of f_{old} Wood = 29.5%. Thus, it appears to be slightly lesser than 3 times than the value established in MP6 for f_{old} Wood.

Documentation provided by project participant

PoA 5342 MP#7 Nigeria MR2 v3.0 15082020

DOE assessment**Date: 17/08/2020**

1. The monitoring survey sheet was reviewed, and it was confirmed that none of the charcoal stove users were using the baseline charcoal stoves along with the ICS. In-line to para 20(b) of the applied methodology AMS-II.G. version 3.0, value of μ_{old} is determined if applicable to apply the discounting factor to the value of parameter B_{old} . Thus, the monitoring of the parameter μ_{old} was not found to be relevant during the current monitoring period and the value of μ_{old} charcoal as zero was found to be acceptable.
2. The achieved value of f_{old} Charcoal was reviewed from the monitoring sheet and it was confirmed that the value of zero has been correctly calculated and it is totally based on the monitoring results. The scarce use of baseline charcoal stove along with the project stove as per the monitoring results were found to be used scarcely by the end-users thus, the value of zero for f_{old} charcoal is justified.

The value of f_{old} wood achieved in MP7 was found to be 18.2% and the value for f_{old} wood in MP 6 was around 11.9%, which denoted that there has been an increase of around 50% in the value of f_{old} wood, from MP6 to MP7. However, as the required precision was not found to be met in MP7 thus, CME had applied upper bound value of f_{old} wood (=29.5%) which was found to be slightly less than three times than the value established in MP6. Thus, the achieved value for both the parameters (f_{old} charcoal and f_{old} wood) were found to be acceptable.

Thus, CL#01 stands closed.

CL ID	02	Section no.	E.3.4.3	Date : 21/10/2020
Description of CL				
<p>"The PoA-DD (page 59) states that the parameter sampling frame will include ICS of different vintages (i.e. year of distribution). It is observed that</p> <ul style="list-style-type: none"> (i) the stoves were distributed between 2018 and 2020; (ii) the Tab "WBT summary" has listed the stoves sampled for the sample monitoring of the thermal efficiency and other parameters; and (iii) the CPA distribution database spreadsheet provides details on which stoves have been sampled. <p>The CME is requested to provide a further information on how it has implemented the monitoring of efficiency of cookstove considering the PoA-DD since both WBT summary spreadsheet and CPA distribution database</p>				

spreadsheet indicate that the vintage of 2018 was not included in the monitoring of efficiency of stoves."

Project participant response**Date: 20/11/2020**

Firstly, page 59 of the PoA-DD no-where mentions / requires that "parameter sampling frame will include ICS of different vintages". The exact text mentioned on page 59 for parameters (SOF, f_{old} , μ_{old} , and η_{new}) is as follows:

"First monitoring will occur within 24 months of ICS distribution at the latest, and will include ICS of different vintages"

Please note the following in this regard:

1. The header of this column in the table, where aforesaid text is specified, is "Timing" and not sampling frame. Thus, this requirement is deemed related only to the first monitoring which is far over.
2. The concerned monitoring is the 7th monitoring period under the PoA and 2nd for the CPAs covered in the monitoring report.
3. The header clearly mentions this to be indicative and hence is deemed non-binding.
4. The text mentions "ICS of different vintages" to be part of monitoring samples but does not mandates "all vintages" to be part of monitoring samples.

Thus, there is no requirement in the PoA-DD, for monitoring samples listed under "WBT Summary" or "Monitoring Survey Summary" to have stoves from each vintage.

Lastly, the ICS (improved cook stoves) distributed under the CPAs covered in the MR are as follows:

ICS Model (Type & year)	Year			Total
	2018	2019	2020	
Stove Model Type				
CH2200	0	2850	376	3226
Econochar/SmartSaver Charcoal	468	5490	0	5958
Econofire/SmartSaver Wood	39	2113	0	2152
Total	507	10453	376	11336

A detailed database including each of these 11,336 ICS with their end-user details and their unique serial number was submitted to the verification team and has been reviewed by the verification team as listed in the FVR, Appendix 3, item 5 and 40.

For the purpose of sample selection, the aforesaid population was categorized under two sampling frames, i.e. charcoal ICS (CH2200 and Econochar) and woodfuel ICS (Econofire) as justified in the MR page 15. Thus, the sampling frame for Charcoal ICS included 9184 units (= 3226 CH220 units covering 2019 and 2020 vintages and 5958 Econochar units covering 2018 and 2019 vintages) and that for woodfuel ICS included 2152 units (= 3137 Econofire units covering 2018 and 2019 vintages).

Subsequently, requisite random numbers were generated using online using stattrek random number generator (<https://stattrek.com/statistics/random-number-generator.aspx>), evidence of which has been reviewed by the verification team as listed in the FVR, Appendix 3, item 37, as follows:

1. 100 random numbers from a range of 1 to 9184 were selected from charcoal ICS sampling frame
2. 50 random numbers from a range of 1 to 2152 were selected for woodfuel ICS sampling frame

Thus, each ICS unit in the given sampling frames had an equal chance of being selected for monitoring.

Given the % share of 2018 ICS in the total charcoal ICS population (sampling frame) is ~5.1% only 4 samples out of 100 random samples selected for charcoal ICS were 2018 samples.

For woodfuel ICS as 2018 population is only ~1.8% of total woodfuel ICS population (sampling frame), hence only 2019 and 2020 ICS samples cropped up in the randomly selected ICS for sampling and no sample of 2018 was automatically selected. This is completely outside the control of CME given the sampling was purely random as well as confirms representativeness of sampling population.

83 of the 100 randomly selected charcoal ICS samples and 44 of the 50 randomly selected wood-fuel samples were monitored for SOF, f_{old} and μ_{old} due to some samples being non-responsive or not willing to participate in monitoring surveys.

Incidentally all the 4 samples of 2018 vintage for charcoal stoves were non-responsive or non-interested users and hence are not represented in the monitoring survey. A subset of selected survey samples, found operational during monitoring, were monitored for WBT hence, no 2018 samples could be monitored for WBTs.

Finally, there is no requirement in the methodology to monitor stoves of all vintages, neither in the registered PoA-DD or the CPA-DDs covered in the monitoring report.

Documentation provided by project participant

-

DOE assessment

Date: 23/11/2020

The applied methodology AMS-II.G. version 3.0, does not refer to the term 'vintage' or 'batch' and hence there is no methodological requirement that ICS of 2018 must be covered under WBTs conducted by CME.

The PoA DD, page 59 quotes:

"First monitoring will occur within 24 months of ICS distribution at the latest and will include ICS of different vintages".

This text is clearly mentioned as "indicative" in the PoA-DD and hence is deemed non-binding on CME by the verification team and it prescribes the condition to be applicable for the first monitoring. Moreover, the statement requires different vintages to be considered and does not mandate all vintages

The CME has conducted simple random sampling considering all the ICSs vintages listed within PoA population. The sampling frames were formed based on the criteria defined on page 57 of the PoA DD and as clarified in the MR, page 15. All the ICS units under a given sampling frame had an equal chance of being picked up for monitoring with ICS of different vintages (2018, 2019 and 2020) being included in the sampling frame, thus the registered sampling plan has been followed.

The CME had shared the screenshot of online random number generator with the referred number of samples being selected for different sampling frames. The random number selection range covered the entire population with a given sampling frame, including 2018 stoves. The screenshots confirm the statement stated above by the CME.

Regarding, the issue of vintage of 2018 was not included in the monitoring. The CME has clearly explained that the proportion of 2018 vintage stoves as compared to the total population is very small, which has led to picking up of only 4 samples out of 100 random samples selected for charcoal ICS and 0 samples out of 50 samples for woodfuel ICS. 10 independent sets of 100 random numbers each for charcoal and woodfuel sampling frames, were also drawn out by the verification team using random.org, as a cross check. For charcoal, the maximum number of 2018 samples in any of these 10 sets was 5 and in few sets it was as low as 11 or 2 samples only. For woodfuel, none of the sets resulted in 2018 stove getting picked up for monitoring. Thus, the sampling conducted by CME is deemed representative, unbiased, credible and free of any material errors.

Besides, the fact that 2018 stoves (for charcoal due to non-response of users and for woodfuel due to very low share of 2018 stoves in sampling frame) were not covered under monitoring is deemed outside the control of CME.

The later versions of the applied methodology do require batch wise monitoring to ensure ICS of all vintages are covered under monitoring. However, that is not deemed applicable to the PoA unless the PoA period is renewed. In that case too, the vintage wise monitoring shall only be applicable to CPAs included in the PoA under PoA period 2 and not to the CPAs covered under the concerned monitoring report. Besides, the project standard, at any point, does not allow the CME to apply conditions of subsequent version of the methodology without upgradation of the PoA to the corresponding methodology version via a PRC.

Thus, the sampling and monitoring approach followed by the CME is found to comply with the registered PoA-DD and monitoring methodology and hence was accepted by the verification team.

Thus, CL#02 stands closed.

Table 3. CARs from this verification

CAR ID	01	Section no.	E.3.6.4	Date:	25/06/2020
Description of CAR					
ERs achieved mentioned in MR version 2, is inconsistent with the ERs mentioned in the ER sheet (Tab: ER calculation, Row: A42)					
CME response					Date:
					06/07/2020

The ERs achieved have been corrected throughout the MR and now consistent with the ERs mentioned in the submitted ER sheet (Tab: ER calculation, Row: A42). The revised MR is being submitted.	
Documentation provided by the CME	
PoA 5342 MP#7 MR Nigeria v2.0 06072020	
DOE assessment	Date: 24/07/2020
CME has now revised the value of ERs achieved throughout the MR (Version 2.0) and has made it consistent with the ER sheet (Version 2.1). (Closed) Thus, CAR#01 stands closed.	

CAR ID	02	Section no.	E.3.4.2	Date: 25/06/2020
Description of CAR				
<ol style="list-style-type: none"> 1. For parameter N_{all}, Under section E.2., the number of project stoves mentioned is inconsistent with the project stove mentioned in the ER sheet (Tab: ER calculation, Row:A28 and A29) 2. Value of u_{old} is inconsistent with the value mentioned in the ER sheet (Tab: ER calculations, Cell: A23 and A24). 3. For many parameters like $Stove_{year}$, $\eta_{new,y}$, f_{old}, SOF. The ER sheet applied separate values of charcoal/wood. However, in the MR sheet an average value is presented. CME shall clarify 				
CME response				Date: 06/07/2020
<ol style="list-style-type: none"> 1. The number of project stoves installed/distributed i.e. parameter N_{all} have been corrected in MR and now consistent with the project stove installed/distributed mentioned in the submitted ER sheet (Tab: ER calculation, Row:A28 and A29). 2. The value of u_{old} has been corrected in the MR and now consistent with the value mentioned in the submitted ER sheet (Tab: ER calculations, Cell: A23 and A24). 3. For monitoring parameters like $Stove_{year}$, $\eta_{new,y}$, f_{old}, SOF two separate value for charcoal and wood stoves have been mentioned in revised MR. <p>The revised MR is being submitted.</p>				
Documentation provided by the CME				
PoA 5342 MP#7 MR Nigeria v2.0 06072020				
DOE assessment				Date: 24/07/2020
<ol style="list-style-type: none"> 1. CME has now corrected the number of project stoves installed/distributed as mentioned in the MR (Version 2.0) with the number of project stoves mentioned in the ER sheet (Version 2.1). 2. Value of parameter μ_{old} mentioned in the revised MR (Version 2.0) was found to be consistent with the value mentioned in the ER sheet (Version 2.1) 3. CME has now mentioned the separate values for charcoal and wood stoves for the monitoring parameters like $Stove_{year}$, $\eta_{new,y}$, f_{old}, SOF in the revised MR (Version 2.0) <p>Thus, CAR#02 was closed.</p>				

CAR ID	03	Section no.	E.2.1	Date : 24/07/2020
Description of CAR				
Section C.1 of the MR mentions that only one ICS unit is given to a household and no HH in the CPA-database owns more than one ICS unit. However, as per the CPA distribution database it was observed that few of the HHs owned more than one ICS unit (e.g. Funke Bello, Cell: G905 & G919, Worksheet: Charcoal). CME shall explain how double counting has been avoided. (Open)				
Project participant response				Date: 28/07/2020

The ICS distribution in the CPAs covered in the monitoring report is fully sponsored by CERPD. Given, only one ICS can be credited per household hence it is ensured that any HH possess only one unit of project ICS and there are no users with multiple ICS units. For this purpose, at the time of distribution a potential beneficiary has to confirm that they are not having any other Envirofit ICS. The beneficiary receives a project ICS only if it is singular Envirofit ICS for the beneficiary. This information is captured in the end user agreement / CPA distribution record which is used to prepare the CPA distribution database.

Secondly, the CPA distribution database is checked for duplicate serial numbers or multiple stoves per household and any such cases are removed from the CPA Distribution Database. The case referred in the CAR above reflects two different beneficiaries with same name but different addresses. Hence, there is no double counting in this case. Additionally, if one checks the name, address and phone number combination (deemed unique for a given beneficiary) in the CPA Distribution database, no two project ICS are found stacked confirming no double counting of emission reductions.

Lastly, at the time of ex-post sample-based monitoring, the presence of multiple project ICS in a given household is also confirmed. In case samples report more than 1 ICS unit in the household, the ICS population is mandated to be discounted accordingly as per the registered monitoring plan. In the current monitoring, no sample has reported using more than one project ICS hence any discount to ICS population is not necessitated.

Documentation provided by project participant

DOE assessment	Date: 31/07/2020
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The CPA-distribution database shared by CME was reviewed to confirm if there is any beneficiary with multiple ICS. It was found that no beneficiary has more than one ICS unit at the same address/location. Thus, no discount was applied to the ICS population in-line to the registered monitoring plan which was found to be acceptable.

Thus, CAR#03 stands closed.

Table 4. FARs from this verification

FAR ID	NA	Section No.	-	Date: DD/MM/YYYY
Description of FAR				
<i>No FAR from this verification</i>				
-CME response				Date: DD/MM/YYYY
NA				
Documentation provided by the CME				
NA				
DOE assessment				Date: DD/MM/YYYY
NA				

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Document information

Version	Date	Description
03.0	31 May 2019	Revision to: <ul style="list-style-type: none"> Ensure consistency with version 02.0 of the “CDM validation and verification standard for programmes of activities” (CDM-EB93-A08-STAN); Make structural and editorial improvements.
02.0	29 December 2017	Revision to align with the requirements of the “CDM validation and verification standard for programme of activities” (version 01.0).
01.0	5 June 2015	Initial publication.

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