

PoA VERIFICATION REPORT for the CDM Programme of Activity

Envirofit International Ltd.

African Improved Cooking Stoves
Programme of Activities

In
Ghana, Nigeria and Liberia

Report No: CCL223ENVIROFIT/VER/01/GHANA

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India



I. PROJECT DATA

Title of the PoA	African Improved Cooking Stoves Programme of Activities		
Registration No. / Date of the PoA:	5342 / 06/-12/-2012		
Title of CPA/s verified¹:	<ul style="list-style-type: none"> CPA1 Title: African Improved Cooking Stoves Programme of Activities – CPA No. 00001 (Ghana) Reference number: 5342-0001 Inclusion/Registration date: 06-12-2012 CPA2 Title: African Improved Cooking Stoves Programme of Activities CPA 00002 (Ghana) Reference number: 5342-0002 Inclusion/Registration date: 21-10-2013 CPA3 Title: African Improved Cooking Stoves Programme of Activities CPA 00003 (Ghana) Reference number: 5342-0003 Inclusion/Registration date: 08-11-2013 		
Monitoring period:	15/-12/-2012 — 14/-12/-2013		
Monitoring Period Number:	1		
Methodology/ies:	AMS-II.G Version 03	Sectoral Scope/Technical Area	3 (3.1)
Publication of MR²:	The monitoring report (version 1.2, 08/09/2014) was published at UNFCCC website on 11/09/2014 (http://cdm.unfccc.int/PoAIssuance/mon_db/poamon887203815/edit?viewmode=1).		
Final Monitoring Report:	Version <u>23</u> .0, 17/ 42 03/2014 <u>5</u>		
Emission reductions (estimated):	CPA00001 GHG emission reductions: 15,477 tCO ₂ eq CPA00002 GHG emission reductions: 5,666 tCO ₂ eq CPA00003 GHG emission reductions: 1,803 tCO ₂ eq		
Emission reductions (verified):	CPA00001 GHG emission reductions: 12,472 tCO ₂ eq CPA00002 GHG emission reductions: 0 tCO ₂ eq CPA00003 GHG emission reductions: 0 tCO ₂ eq		
GHG reducing measure/technology of the CPA/s of the PoA:	The PoA will help in reducing the emissions of greenhouse gases by distribution of the fuel-efficient charcoal based cook stoves in Ghana. The fuel-efficient cook stoves are replacing the baseline charcoal stoves in common use (baseline scenario).		

Party	CME/Project participants	Party considered a project participant	Contract party
Ghana(Host)	Envirofit International Ltd.	No	<input checked="" type="checkbox"/>
Nigeria (Host)	Envirofit International Ltd.	No	<input checked="" type="checkbox"/>
Liberia (Host)	Envirofit International Ltd.	No	<input checked="" type="checkbox"/>
United Kingdom	Envirofit International Ltd.	No	<input checked="" type="checkbox"/>

II. VERIFICATION TEAM (compliance of § 330 b of VVS)

Verification Team	Role
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¹As per § 352 of VVS, the request shall relate to all CPAs included in the PoA during the specified monitoring period.

²As per current rules, consolidated MR for all CPAs included in the PoA during the specified monitoring period.




Full name	Affiliation	Appointed for Sectoral Scopes (Technical Areas)	Team leader	Acting/trainee Team Leader	Local Expert	Team Member (Auditor)	Technical Expert	Acting/Trainee Tech. Expert	Trainee Auditor	Technical Reviewer	Expert to TR	Trainee TR
Anubhav Dimri	RSA India	1.1, 1.2, 3.1, 13.1	X				X					
Sanjay Kumar Agarwalla	India	1.1, 1.2, 2.1, 3.1, 4.1, 5.1, 5.2, 9.1, 9.2, 13.1				X	X					
Adam Simcock	RSA	--			X							
Vikash Kumar Singh	RSA India	1.2, 3.1, 4.1, 13.1, 13.2								X		

III. VERIFICATION REPORT

Verification Phases and Status:

- ☒ Desk Review ☒ Follow up interviews, On Site Assessment
☒ Resolution of outstanding issues ☒ Corrective Actions / Clarifications Requested
☒ Full Approval and Submission for Issuance ☐ Rejected

Verification Report	Version	Date
	Version 1	03/10/2014
	Version 2	18/12/2014
	Version 3	20/03/2015
Final Approval Date	Approval	Distribution
Date: 2015-03-30 ²⁷	 By: Amit Anand	<input checked="" type="checkbox"/> No distribution without permission from the Client or responsible organizational unit <input type="checkbox"/> Limited Distribution <input type="checkbox"/> Unrestricted distribution

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Abbreviations

AQL	Acceptable Quality Limit
BAU	Business As Usual
CA	Corrective Action / Clarification Action
CDM	Clean Development Mechanism
CER	Certified Emission Reduction
CAR	Corrective Action Request
CC IPL	Carbon Check (India) Private Ltd.
CER	Certified Emission Reduction
CEESD	Centre of Energy, Environment and Sustainable Development
CL	Clarification Request
CME	Co-ordinating and Managing entity
CPA	Component Project Activity
CPA-DD	Component Project Activity Design Document
CO₂	Carbon Dioxide
CO_{2e}	Carbon Dioxide Equivalent
DOE	Designated Operational Entities
DVR	Draft Verification Report
EB	CDM Executive Board
EF	Emission Factor
FA	Final Approval
FAR	Forward Action Request
FVR	Final verification Report
GHG	Greenhouse gas(es)
GWh	Giga Watt Hour
IPCC	Intergovernmental Panel on Climate Change
MWh	Mega Watt Hour
PoA	Programme of Activities
PoA-DD	Programme of Activities Design Document
PP	Project Participant
OSV	On Site Visit
QC/QA	Quality control/Quality assurance
RMP	Revised Monitoring Plan
<u>RSA</u>	<u>Republic of South Africa</u>
TA	Technical Area
TR	Technical Review
UNFCCC	United Nations Framework Convention on Climate Change
UQL	Unacceptable Quality Limit
VVS	Validation and Verification Standard
WBT	Water boiling test



Verification Opinion — summary^{compliance of§ 330(a) of VVS}

Carbon Check (India) Private Ltd. (CC IPL) has performed the first periodic verification of the registered CDM Programme of Activities “African Improved Cooking Stoves Programme of Activities” having UNFCCC reference number as 5342 for the CPAs titled “African Improved Cooking Stoves Programme of Activities – CPA No. 00001 (Ghana)”; “African Improved Cooking Stoves Programme of Activities CPA 00002 (Ghana)” and “African Improved Cooking Stoves Programme of Activities CPA 00003 (Ghana)” with UNFCCC reference numbers 5342-0001, 5342-0002 and 5342-0003 respectively for the three CPAs. The CPAs covered for this verification are the ones which have crediting period falling within this monitoring period and the other CPAs although included were not considered for this first periodic verification because their crediting period is beyond the current monitoring period. Moreover it is inline with the approval provided by UNFCCC /11/ ; allowing Carbon Check to perform verification of the PoA and CPA 5342-0001,5342-0002 and 5342-0003. During the current monitoring period only CPA 1 was implemented and the other two CPAs were not implemented. Hence basically the monitoring covers only CPA 1. The verification team assigned by the DOE concludes that the PoA-DD (Version 4.3, dated 07/06/2014), Component Project Activity 1 as described in the registered CPA-DD (Version 3.2, date 27/11/2012) and monitoring report (version 23.0, dated 17/~~4203~~/2014⁵), meets all relevant requirements of the UNFCCC for CDM project activities including article 12 of the Kyoto Protocol and paragraph 62 of CDM M& P, the modalities and procedures for CDM (Marrakesh Accords) and the subsequent decisions by the COP/MOP and CDM Executive Board. The verification has been conducted in-line with the VVS requirements version 07.0/B01-1/.

Verification methodology and process

The Verification team confirms the contractual³ relationship signed on 19/09/2013 between the DOE, Carbon Check (India) Private Ltd. and the Co-ordinating Managing Entity/ Project Participant, (Envirofit International Ltd.). The team assigned to the verification meets the CC IPL’s internal procedures including the UNFCCC requirements for the team composition and competence. The verification team has conducted a thorough contract review as per UNFCCC and Carbon Check procedures and requirements.

The verification has been performed as per the requirements described in the VVS version 07.0 and constitutes the review and completion of the following steps:

- Reviewing the approved revised PoA-DD (version 4.3, date 07/06/2014), the registered CPA DD for CPA 1 (Version 3.2, date 27/11/2012), including the monitoring plan and the corresponding validation report/s;
- Publication of the MR on the UNFCCC website (version 1.2, 08/09/2014)
- Desk review of the validation report, MR and other relevant documents including documents related to the projects activities in emission reductions
- Review of the applied monitoring methodology (AMS-II.G version 03);
- Review of any CMP and EB decisions, clarifications and guidance;
- On-site assessment (24/09/2014 – 26/09/2014)
- Resolution of CARs and CLs raised during verification
- Issuance of Verification Report

The component project activity was correctly implemented according to selected monitoring methodology, monitoring plan and the registered/included CPA DD/s. The monitoring system

³Subsequent to the transfer of accreditation from CarbonCheck (Pty) Ltd to CarbonCheck (India) Private Ltd., an addendum to the contract was assigned between CarbonCheck (India) Private Ltd. and the CME of the PoA.



was installed, maintained in a proper manner, while collected monitoring data allowed for the verification of the amount of achieved GHG emission reductions. Through the review and on site visit the verification team confirms that the PoA has resulted in the 12,472 tCO₂e emission reductions during the first monitoring period.

During the reported monitoring period only CPA 1 was implemented and the other two CPAs were not implemented (i.e. no stoves were sold under these two CPAs). Hence only CPA 1 was monitored during this monitoring period and is the only one eligible to claim emission reductions. Hence emission reductions have been claimed only for CPA 1 (UNFCCC reference number 5342-0001) and no emission reductions are being claimed for CPA 2 and CPA 3:

Verified emission reductions for the PoA: 12,472 tCO₂e

The break-up of emission reduction up-to 31/12/2012 and 01/01/2013 onwards as verified during the course of verification are as below:

Item	Emission reductions up to 31 December 2012	Emission reductions from 1 January 2013 onwards
Emission reductions (t CO ₂ e)	458	12,014

Break up of emission reductions CPA wise:

CPA 1; 12,472 tCO₂e

CPA 2: 0 tCO₂e

CPA 3: 0 tCO₂e

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



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1. INTRODUCTION

The Co-ordinating Managing Entity/Project Participant has commissioned the DOE, Carbon Check (India) Private Ltd. to perform an independent verification of the CDM Programme of Activity “African Improved Cooking Stoves Programme of Activities” in Ghana (hereafter referred to as “Programme of Activity or PoA”) for the CPAs titled “African Improved Cooking Stoves Programme of Activities – CPA No. 00001 (Ghana)”; “African Improved Cooking Stoves Programme of Activities CPA 00002 (Ghana)” and “African Improved Cooking Stoves Programme of Activities CPA 00003 (Ghana)”. This report summarises the findings of the verification of the project, performed on the basis of paragraph 62 of the CDM M & P, as well as criteria given to provide for consistent project operations, monitoring and reporting and the subsequent decisions by the CDM Executive Board. Verification is required for all registered CDM project activities intending to confirm their achieved emission reductions and proceed with request for issuance of CERs. This report contains the findings and resolutions from the verification and a certification statement for the certified emission reductions.

1.1 Objective

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

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

The objective of this verification was to verify and certify emission reductions reported for the “African Improved Cooking Stoves Programme of Activities” in the host country “Ghana” for the period 15/12/2012 to 14/12/2013.

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

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

1.2 Scope

The scope of the verification is:

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



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

The verification comprises a review of the monitoring report over the monitoring period from 15/12/2012 to 14/12/2013 and based on the registered/included CPA-DD in part of the monitoring parameters and monitoring plan, emission reduction calculation spreadsheet, monitoring methodology and all related evidence provided by project participant.

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

2. METHODOLOGY

The verification consists of the following four phases:

1. Completeness check and webhosting of the Monitoring report on UNFCCC website;
2. Desk review of the validation report, monitoring plan, monitoring report, monitoring methodology, component project design document (CPA-DD), programme of activity design document (PoA-DD), applicable tools in particular attention to the frequency of measurements, quality of metering equipment's including calibration requirements, QA/QC procedures and other relevant documents;
3. On-site visit (including follow-up interviews with project stakeholders, when deemed necessary). The on-site assignment includes the following;
 - An assessment of implementation and operation of the component project activity with respect to registered/included CPA-DD or approved revised CPA-DD;
 - Review of information flows for generating, aggregating and reporting the monitoring parameters;
 - Interview with relevant personals to determine whether the operational and data collection procedures are implemented and in accordance with monitoring plan of the CPA-DD;
 - Cross check of information and data provided in the monitoring report with plant logbooks, inventories, purchase records or similar data sources;
 - Check of monitoring equipment's, calibration frequency and monitoring practice in-line with methodology and CPA-DD;
 - Review of assumptions made in calculating the emission reduction;
 - Implementation of QA/QC procedure in-line with the CPA-DD and methodology requirement.
4. Resolution of outstanding issues and the issuance of the final Verification report and Certification statement.

The following sections outline each step in more detail.

2.1 Desk review^(compliance of § 259 and § 262 of VVS)

The following table outlines the documentation reviewed during the verification:

Ref no.	Reference Document
/1/	1. Webhosted Monitoring report, version 1.2, 08/09/2014 2. Monitoring report, version 1.3, 13/10/2014 3. Monitoring report, version 1.4, 18/11/2014 4. Monitoring report, version 1.5, 21/11/2014 4-5. <u>Monitoring report, version 02.0, 17/12/2014</u>
/2/	Final Monitoring report, version <u>23.0, 17/12/2014</u>
/3/	Emission reduction calculation spread sheet, corresponding to /1-1/ Emission reduction calculation spread sheet, corresponding to /1-2/
/4/	Emission reduction calculation spread sheet, corresponding to /2/



/5/	CPA Monitoring Records and end user behaviour records
/6/	CPA distribution records and evidence for the first date of distribution of cook stove under CPA00001 on 23/02/2012
/7/	Stove specifications for CH 2200 and CH2300 models used under the CPA 1
/8/	Proof of Carbon Credits waiver by End user
/9/	Sample stoves sales receipt
/10/	Training records
/11/	Letter from UNFCCC dated 29/04/2014, reference number 343_INQ-01496_Carbon Check_Response- Allowing Carbon Check to perform verification of the PoA and CPA 5342-0001,5342-0002 and 5342-0003.
/12/	Water boiling test records
/B10/	<u>Guideline: Sampling and surveys for CDM project activities and programmes of activities, Version 03.0</u>

2.2 Background documents:

Ref no.	Reference Document
/B01/	1. Validation and Verification Standard version 07.0 2. Project Standard version 07.0 3. Project Cycle Procedure version 07.0
/B02/	Applied baseline and monitoring methodology, AMS-II.G, version 03
/B03/	1. Guideline: Completing the monitoring form, version 04 2. Template of MR available on UNFCCC website
/B04/	Approved revised PoA-DD (version 4.3dated 07/06/2014), (CPA-DD for CPA 1: version 3.2dated 27/11/2012) and corresponding validation report.
/B05/	Guideline on the application of Materiality in verifications (version 01.0)
/B06/	1. Post Registration Changes and Requests for Issuance: Completeness Check Checklist 2. Post Registration Changes and Requests for Issuance: Information and Reporting Check Checklist
/B07/	Standard: Standard for sampling and surveys for CDM project activities and Programme of Activities, version 04.1
/B08/	Websites: http://cdm.unfccc.int/ http://www.ipcc-nggip.iges.or.jp/ http://www.pciaonline.org/testing
/B09/	Technical Specification of CH 2200 and CH 2300: http://www.envirofit.org/products/?pid=2 http://www.envirofit.org/products/?sub=cookstoves&pid=1003



2.3 On-site visit and follow-up interviews with project stakeholders

An OSV was performed by the verification team of Carbon Check on dates 24/09/2014 to 26/09/2014 and it aims to the following:

- An assessment of the implementation and operation of the registered project activity as per the registered/approved revised PoA-DD, registered/included CPA-DD or any approved revised CPA-DD;
- A review of information flows for generating, aggregating and reporting the monitoring parameters;
- Interviews with relevant personnel to determine whether the operational and data collection procedures are implemented in accordance with the monitoring plan in the CPA-DD;
- A cross check between information provided in the monitoring report and data from other sources such as plant logbooks, inventories, purchase records or similar data sources;
- A check of the monitoring equipment including calibration performance and observations of monitoring practices against the requirements of the CPA-DD and the selected methodology and corresponding tool(s), where applicable;
- A review of calculations and assumptions made in determining the GHG data and emission reductions;
- An identification of quality control and quality assurance procedures in place to prevent or identify and correct any errors or omissions in the reported monitoring parameters.

The project representatives and stakeholders interviewed:

	Name	Organization	Topic
/i/	Edem Cudjoe Bensah	Bioenergy Coordinator, CEESD	Project implementation and operation, monitoring procedure, data and information flow, compliance of monitoring plan with monitoring methodology approved CPA-DD, Roles and responsibility, CER calculation and completeness of monitoring report, Electronic Monitoring system
/ii/	Joseph Rebeiro	Coordinator, CEESD	Data and information flow, Data input device, Roles and responsibility, Project implementation and operation, monitoring procedure, Sales/Distribution records, Survey records, Qualification and Training
/iii/	Edward Antwi	Assistant Director, CEESD	Project implementation and operation, monitoring procedure, Survey records, Data and information flow, Data input device, Roles and responsibility, Quality Assurance – Management and operating system
/iv/	Nick Marshal	Envirofit International Ltd.	Project operation and future plans
/v/	Rohit Lohia	Envirofit International Ltd.	Project operation and future plans

2.4 Resolution of outstanding issues

The objective of this phase of the verification is to resolve any outstanding issues (issues that require further elaboration, research or expansion) which have to be clarified/corrective action done prior to final DOE's conclusions on the project implementation, monitoring practices and achieved emission reductions. In order to ensure transparency a verification protocol is completed for the project activity. The protocol shows in transparent manner criteria (requirements), means of verification and resulting statements on verification actual project activity against identified criteria.



The verification protocol serves the following purposes:

- It organises in a table form, details and clarifies the requirements, which CDM project is expected to meet CDM requirements;
- It ensures a transparent verification process where the DOE will document how a particular requirement has been verified and the result of the verification.
- It ensures that the issues are accurately identified, formulated, discussed and concluded in the validation report.
- It ensures the determination of achieving credible emission reductions from the project activity.

The verification protocol consists of two tables. Table 1 reflects the verification requirements and reference to the materials used to verify the project activity against those requirements, as well as means of verification, reference to Table 2 (i.e. tables of findings) and preliminary and final opinion of the DOE on every particular requirement listed in table 1.

Verification Protocol Table 1: Requirement checklist				
Checklist question	Verification Team Comment	Reference /MoV	Findings, comments, references, data sources / Draft Conclusion	Final Conclusion
<i>The checklist items in Table 1 are linked to the various requirements the project should meet. The checklist is organised in various sections. Each section is then further sub-divided as per the requirements of the topic and the individual project activity.</i>	<i>The section is used to elaborate and discuss the checklist item in detail. It includes the assessment of the Verification team and how the assessment was carried out. The reporting requirements of the VVS and Project Standard shall be covered in this section.</i>	<i>Gives reference to the information source on which the assessment is based on</i>	<i>Assessment based on evidence provided if the criterion is fulfilled (OK), or a CAR, CL or FAR is raised (see below). The assessment refers to the draft verification stage.</i>	<i>In case a corrective action or a clarification request the final assessment at the final verification stage is given.</i>

The findings of verification process are summarized in the tables below.

Finding (reference section of table 1)			
Classification	<input type="checkbox"/> CAR	<input type="checkbox"/> CL	<input type="checkbox"/> FAR
Description of finding (DOE)			
Corrective Action or clarification #1 (PP shall write a detailed and clear corrective action or further information for clarification as per finding)			



Finding (reference section of table 1)	
DOE Assessment #1 <i>The assessment shall encompass all open issues in the finding. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	
Conclusion <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the next periodic verification <input type="checkbox"/> Outstanding finding (not closed) <input type="checkbox"/> The finding is closed

In Table 2, FAR shall reflect the forward actions initiated by the verification team if the monitoring and reporting require attention and/or adjustment for the next verification period. The completed verification protocol for this project is enclosed in Appendix B to this report.

Findings during the verification can be interpreted as a non-compliance with CDM criteria or a risk to the compliance.

Corrective action requests (CARs) are raised, in case:

- Non-conformities with the monitoring plan or methodology are found in monitoring and reporting and has not been sufficiently documented by the project participants, or if the evidence provided to prove conformity is insufficient;
- Modifications to the implementation, operation and monitoring of the registered project activity has not been sufficiently documented by the project participants;
- Mistakes have been made in applying assumptions, data or calculations of emission reductions which will impair the estimate of emission reductions;
- Issues identified in a FAR during validation/previous verification(s) that are not being resolved by the project participant(s) to be verified during current verification.

Requests for clarification (CLs) are raised, if information is insufficient or not clear enough to determine whether the applicable CDM requirements have been met.

A forward action request (FAR) is raised during verification to highlight issues related to project implementation/monitoring that require review during the subsequent verification of the project activity. FARs shall not relate to the CDM requirements for issuance.

2.5 Internal quality control

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

2.6 Verification Team (compliance of § 330 b of VVS)

Carbon Check has appointed a competent team as per the Accreditation Standard and Carbon Check internal procedures, the team is outlined below:

Verification Team			Type of Involvement						
Full name	Location	Appointed for Sectoral Scopes (Technical Areas)	Supervising the work	Desk review	Site Visit + Interview	Report and protocol Writing	Technical Expert Input	Reporting Support	Technical Reviewer
AnubhavDimri	RSALn	1.1., 1.2, 3.1., 13.1	X	X	X	X	X		



	<u>dia</u>								
Sanjay Kumar Agarwalla	India	1.1, 1.2, <u>2.1</u> , 3.1, <u>4.1</u> , <u>5.1</u> , <u>5.2</u> , <u>9.1</u> , <u>9.2</u> , <u>13.1</u>					X	X	
Adam Simcock	RSA	--			X			X	
Vikash Kumar Singh	<u>RSA</u> <u>dia</u>	1.2, 3.1, <u>4.1</u> , 13.1, <u>13.2</u>							X

3. VERIFICATION FINDINGS^(Compliance of § 330 c of VVS)

The findings of the verification are described in the following sections. The verification criteria (requirements), the means of verification and the results of verification are documented in detail in the verification protocol in Appendix B.

3.1 Project implementation

The implementation of the component project activity^{(compliance of § 330 d (i) of VVS)}

Co-ordinating and Managing entity/Project Participants:	Envirofit International Ltd.
Title of the PoA:	African Improved Cooking Stoves Programme of Activities
UNFCCC registration No:	5342
Applied Baseline and monitoring methodology:	AMS-II.G(version 03)

Title of the CPA:	African Improved Cooking Stoves Programme of Activities – CPA No. 00001 (Ghana)
CPA reference number:	5342-0001
Date of inclusion:	06/12/2012
CPA start date:	03/01/2012
CPA start of operation:	Sale/Distribution of stoves – 23/02/2012 /06/
CPA implementer	Centre of Energy, Environment and Sustainable Energy (CEESD)
Project Scale:	Small scale
Location of the CPA:	Ghana
CPA crediting period:	15/12/2012 to 14/12/2022
Reported monitoring Period verified in this verification:	15/12/2012 to 14/12/2013

Title of the CPA:	African Improved Cooking Stoves Programme of Activities – CPA No. 00002 (Ghana)
CPA reference number:	5342-0002
Date of inclusion:	21/10/2013
CPA start date:	11/08/2013
CPA start of operation:	Not started in this monitoring period
CPA implementer	Envirofit International Ltd.
Project Scale:	Small scale
Location of the CPA:	Ghana
CPA crediting period:	01/11/2013 to 31/10/2023
Reported monitoring Period verified in this verification:	01/11/2013 to 14/12/2013

Title of the CPA:	African Improved Cooking Stoves Programme of Activities – CPA No. 00003 (Ghana)
CPA reference number:	5342-0003
Date of inclusion:	08/11/2013
CPA start date:	06/06/2012



CPA start of operation:	Not started in this monitoring period
CPA implementer	Envirofit International Ltd.
Project Scale:	Small scale
Location of the CPA:	Ghana
CPA crediting period:	01/12/2013 to 30/11/2023
Reported monitoring Period verified in this verification:	01/12/2013 to 14/12/2013

It is evident from the above tables that during the current monitoring period, only CPA 1 was implemented and hence monitored. The CPA 2 and CPA 3 were not implemented (no stoves were distributed) and hence not monitored. No emission reductions are being claimed for CPA 2 and CPA 3. As part of the site visit, the verification team was able to confirm that the Programme of activities and the component project implementation is in accordance with the project description contained in the registered/included CPA-DD for CPA 1 of 27/11/2012/B04/. The verification team took cognizance of § 244, 245 & 248 of CDM Project Standard and § 270 (a) and § 271 of VVS.

Project physical features (technology, project equipment, monitoring and metering equipment)	<p>The CPA includes distribution of energy efficient improved cooking stoves. The CPA implementer is Centre of Energy, Environment and Sustainable Energy (CEESD).</p> <p>The portable improved cook stoves (ICS) use charcoal as fuel. These ICSs are more efficient in transferring heat from the fuel to the pot, thus saving charcoal compared to the traditional charcoal stoves currently used by the Ghanaian households. Furthermore, the ICSs applied in this CPA have been designed not only to increase heat transfer, but also to match traditional utensils and cooking habits of the people in Ghana.</p> <p>There are two models of stoves being used in the CPA 1:</p> <ol style="list-style-type: none"> 1. CH2200 2. CH2300 <p>The stove efficiency determined for each of the stoves, as determined through sampling is:</p> <ol style="list-style-type: none"> 1. CH2200 – 33.06 (average) 2. CH2300 – 32.57 (average) <p>The stove efficiency has been determined through water boiling tests/05/.</p> <p>There were no changes observed during OSV from the technology stated during the validation.</p>
Any Project Design Change been sought and approved by EB for the CPA? (compliance of § 33049 (f) of VVS)	<div> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No </div> <p>No project design change has been sought from EB for the CPA.</p>

The implemented CPA involves distribution and sales of fuel-efficient charcoal stoves by CEESD in individual households of Ghana. It was confirmed through the monitoring database/05/ that the CPA involves distribution and installation of only 9,446 stoves till the end of the monitoring period. But during the monitoring it was found that information for 71 stoves could not be found and hence these were treated as non responsive and not counted in the CPA. Hence total number of cook stoves considered under the CPA during the monitoring and for emission reduction calculation is 9,375. The annual energy savings was found to be 42,676 MWh for the CPA which is less than 60,000 MWh_{th} and thus the CPA remains under the microscale limit.

The stoves in the CPA have been distributed across different locations in Ghana. As confirmed through the monitoring database provided in the ER spread sheet, first stove for the CPA was distributed on 23/02/2012 /06/ and last stove on 04/11/2013. All the stoves that



were checked during verification survey were found to be working and with the serial number marked on the stoves.

The component project activity was implemented and equipment installed as described in the registered/included CPA DD.

It was confirmed during OSV that Envirofit International Ltd. is the Co-ordinating/Managing Entity for the PoA. The actual project activity is in line with the registered/included CPA-DD. CEESD is the CPA implementer/ programme activity implementer for the CPA being monitored.

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

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

Subject	Webhosted Monitoring Report (MR) /01/	Verified Monitoring Report /02/
Changes		
CPAs covered in the current monitoring period	CPA 1	CPA 1, CPA 2 and CPA 3

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

However, CAR-01, CAR-02 and CAR-13 were raised and successfully closed (please refer to appendix B of the report for further details of the CARs).

3.2 The actual operation of the CDM project activity (compliance of § 330 d (i) of VVS)

The starting date of the CPA is 03/01/2012 as per the CPA-DD, and the first distribution of stoves took place on 23/02/2012 /06/. A total of 9,446 stoves were distributed in the CPA/05/ during the monitoring period and last one on 04/11/2013 /5/. As stated above during the monitoring it was found that information for 71 stoves could not be found and hence these were treated as non responsive and not counted in the CPA and emission reduction calculation. Hence the total number of stoves, considered during the monitoring period for the CPA is 9,375. The PoA and CPA 1 were registered on 06/12/2012 and the starting date of the crediting period is 15/12/2012 thus CPA is not claiming emission reductions before the start date of crediting period, i.e. 15/12/2012 that is after the registration of the PoA and CPA. Recipient households have signed an acknowledgement (CER waiver forms) that the CPA implementer, CEESD owns the rights to the CERs generated from the CPA. This has been confirmed through the review of actual agreements as evidence/08/. Sample agreements were checked during OSV. Further an agreement has been signed between the CPA implementer and the CME that "*The CPA Implementer shall cede the rights for issuance of the CERs to the CME*", this has been checked during the validation/CPA inclusion as confirmed in the eligibility criteria/B04/. Operation of the devices is confirmed during the site visit by the verification team. Followings were verified at the project site:

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



In accordance with § 273 c) of VVS, version 07, information (data and variables) provided in the monitoring report that are different from that stated in the registered CPA-DD/B04/, have been assessed. The assessment is summarized below:

<u>Parameter</u>	<u>Ex-ante value in the CPA-DD</u>	<u>Actual operation for the reported monitoring period</u>	<u>Assessment by the verification team</u>
<u>Number of cook-stoves (N_{all})</u>	<u>4,500</u>	<u>9,375</u>	<p>Verification team noted that the actual number of cook-stoves distributed under the CPA is higher than the number indicated in the registered CPA DD/B04/. This difference is acceptable based on the following:</p> <ul style="list-style-type: none"> → CPA-DD does not restricts the number of cook stoves to 4,500 which is just an indicative value (as explained below) → The project energy saving is still less than 60 GWh_{tp}/year. → The emission reductions from the project during the reported monitoring period are less than that estimated in the registered CPA DD for the same period. <p>Verification team further noted that the cook-stove numbers as indicated in the registered CPA DD is not a fixed number (thus this cannot be categorized under a design change) and this assessment has been based on review of following paragraphs of CPA DD:</p> <p><i>"The CPA will have a maximum energy saving of less than or equal to 60 GWh_{tp}/year, thus staying within the micro-scale threshold. Based on the estimated energy savings, it is envisaged that around 4,500 stoves will be distributed under the CPA." (Refer Section A.2, of the registered CPA-DD, version 3.2 dated 27/11/2012).</i></p> <p>The number of cook-stoves stated in the CPA-DD is only an indicative number based on the micro-scale annual energy saving threshold of 60GWh_{tp}/year. The 9,375 stoves implemented in the CPA results in 42.676 GWh_{tp}/year of energy saving. The verification team noted</p>



			<p>that with the increase in number of stoves, the CPA still remains under the limit of micro scale and hence this is not deemed as any design change.</p> <p>Verification team during course of verification noted that the average energy savings per stove during the monitoring period depends not just on the thermal efficiency of the stoves (η_{new}), but also on the other monitored parameters, including:</p> <ul style="list-style-type: none"> • “Stove Operation Fraction” (SOF); • “the amount of woody biomass consumption that is consumed through the continued use of old stoves” (μ_{old}); • “the fraction of end users that are still using baseline (replaced) stoves” (f_{old}); and, • “Calculated average stove operation years in the monitoring period” (Stove year). <p>The ex-post monitored values for these parameters were also found to be different from the ex-ante estimates provided in the registered CPA-DD. For instance, SOF was found to be 65.34% instead of the 95% anticipated in the CPA-DD. This is approximately 30% lower than initially assessed in section B.6.1 of the CPA-DD. Stove year was also estimated in the CPA-DD to be 1.00 while the monitored valued is 0.87. The Stove year is lower due to the progressive distribution of cook-stoves over the monitoring period. When considering the differences of the aforesaid five parameter values together, (and not just the thermal efficiency), the average energy savings per stove is approximately 35.02% of what was initially estimated in the CPA-DD (refer CPA-DD section A.4.6) substantiating the increase in number of cook-stoves distributed under the CPA.</p>
Efficiency of the ICS(η_{new})	36.3%	32.7%	The weighted average efficiency of the cook-stoves (η_{new}) monitored ex-post for the current monitoring



			<p>period is less than the estimated ex-ante value in the CPA-DD. Verification team based on its sectoral expertise confirms that decrease in efficiency in actual project condition is a realistic condition and thus this issue does not require further assessment, as it does not lead to increase in emission reductions.</p> <p>This is also deemed acceptable to the verification team as the actual monitored efficiency is lower than the value indicated in the registered CPA DD and it does not lead to increase in emission reductions.</p>
<u>Stove Operation Fraction (SOF)</u>	<u>0.95</u>	<u>0.6534</u>	<p>Since, the monitored ex-post value of SOF for the current monitoring period is less than the estimated ex-ante value in the CPA-DD, this is acceptable to the verification team, as it does not lead to increase of emission reductions.</p> <p>This is deemed acceptable.</p>
<u>The amount of woody biomass consumption that is consumed through the continued use of old stoves (μ_{old})</u>	<u>217.8 kg</u>	<u>2,657 kg</u>	<p>Since, the amount of woody biomass consumption that is consumed through the continued use of old stoves monitored ex-post for the current monitoring period is higher than the estimated ex-ante value in the CPA-DD, this is acceptable to the verification team as it does not lead to increase of emission reductions.</p> <p>This is deemed acceptable.</p>
<u>The fraction of end users that are still using baseline (replaced) stoves (f_{old})</u>	<u>0.1</u>	<u>0.5362</u>	<p>Since, the fraction of end users that are still using baseline (replaced) stoves monitored ex-post for the current monitoring period is higher than the estimated ex-ante value in the CPA-DD, this is acceptable to the verification team as it does not lead to increase of emission reductions.</p> <p>This is deemed acceptable.</p>
<u>Calculated average stove operation years in the monitoring period ($Stove_{year}$)</u>	<u>1</u>	<u>0.87</u>	<p>$Stove_{year}$ monitored ex-post for the current monitoring period is lower than the estimated ex-ante value in the CPA-DD.</p> <p>This is deemed acceptable as it does not lead to increase of emission reductions.</p>



Verification team has assessed the project in order to check any proposed or actual changes to the project design in accordance with VVS Ver. 7 § 314. In the opinion of Carbon Check, there is no change to the project design. Paragraph 271 (a) of PS v7, is not applicable as there is no correction or changes to the project design. This conclusion had been arrived based on the assessment of the project inline with the requirements of § 270 (a) and § 271 of the VVS Version 07.

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

The monitoring report has been submitted for monitoring period 1 (from 15/12/2012 to 14/12/2013).

In summary, the monitoring period is reasonable and the operation of the CPA is in accordance with the registered CPA DD. The verification took cognizance of § 244,245 and 246 of CDM Project Standard and § 262 b (i), 270 (a), 271 (a), (b) and 273 (b) and (c) of VVS version 07.

However, CAR-01, CAR-02 and CAR-13 were raised and successfully closed (please refer to appendix B of the report for further details of the CARs).

3.3 Compliance of the monitoring plan with the monitoring methodology including applicable tool(s) (compliance of § 330d (ii) of VVS)

Any Revision in Monitoring plan is sought and approved by EB for the project?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	No revisions have been sought in the monitoring plan during the current verification
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The verification team determined against all the information provided in the monitoring report, whether in-line with the applied monitoring methodology.

Verification Requirements	Criteria fulfilled	Verification and reporting by the verification team
Any Deviation been sought and approved by EB for the project.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	No deviations have been sought from EB during the current verification
Is complete set of data for the specified monitoring period is available for the CPA	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Yes, complete set of data is available for the reported monitoring period.
Is the required information provided in the monitoring report has been cross-checked with other sources (ex – plant logbooks, inventories, purchase records, laboratory analysis)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	The required information provided in the monitoring report has been cross-checked against the data provided in the ER sheet, monitoring database, copies of agreement between households and CPA implementer and the observations during OSV.
Is the calculation of baseline emissions and project activity emissions and leakage been in accordance with the formulae and methods described in monitoring plan and the applied methodology?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Yes, the calculation of emissions has been done in accordance with the formulae and methods described in monitoring plan and the applied methodology.
Is all assumptions used for emission calculation have been justified	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Yes, all the assumptions used for emission calculation have been justified.



Verification Requirements	Criteria fulfilled	Verification and reporting by the verification team
Is appropriate emission factors, IPCC default values and other reference values have been correctly applied	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Yes, appropriate values of emission factors, efficiency of baseline stoves, net calorific value of the biomass and other default values have been used.
Does the monitoring methodology provides any provision of verification for parameters other than monitoring of GHG data and shall be specific to the applicability criteria of applied methodology.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	No, the monitoring methodology does not provide for verification of parameters other than monitoring of GHG data.

The verification team is able to confirm that the monitoring plan contained in the registered CPA-DD is in accordance with the approved methodology applied by the project activity, i.e. AMS-II.G (version 03).

The monitoring plan is in accordance with the approved methodology, AMS-II.G version 03 /B02/, applied by the component project activity and as provided in the CPA-DD/B04/.

The verification took cognizance of § 249 of CDM Project Standard and § 274 to § 277 of VVS version 07/B01/.

3.4 Compliance of the Actual monitoring with monitoring plan in the CPA DD (compliance of § 330 d (iii) of VVS)

Any Revision in Monitoring plan is sought and approved by EB for the project?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	No revisions in monitoring plan have been sought from EB during the current verification
Does the monitoring report provide line diagram showing all relevant monitoring points?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	CAR 03 had been raised in this regard and has been resolved (Please refer appendix B). Diagrams of the monitoring system, information flow system and the organisation structure have been provided in Section C of the monitoring report /2/. The diagrams provided are in line with the observations during the site visit and the registered PoA-DD and CPA-DD/B04/. Verification team confirms that the monitoring points are implemented in accordance to the diagram and is adequate to ensure the actual emission reduction.

The monitoring has been carried out in accordance with the monitoring plan contained in the registered CPA-DD.

DOE used sampling during verification for checking the stoves. A sample size of 30 households was chosen (no non-responses). A sample size of 30 was required, based on an AQL of 1.0 % and UQL of 15 %, the producer risk used is 5 % and consumer risk used was 5 %. Acceptance number (c) thus determined for the sample is 1. It was observed that all the stoves were in working condition and thus c=0, discrepant records were observed with the webhosted MR/01/ and ER sheet. Thus PP's set of records has been accepted in line with para 28 of the sampling standard, version 04.1/B07/.

The threshold of materiality was evaluated based on §10 and §17 of "Guideline on the application of materiality in verification" Version 01.0 (Annex 6, EB 69) /B05/. It was concluded that the materiality threshold applicable to the project activity based on actual emission reductions achieved is 5% of 12,472 tCO₂e per year, which is equal to 624 tCO₂e.

In planning the verification, verification team took cognizance of paragraph 16 and 17 of "Guideline on the application of materiality in verification" Version 01.0 (Annex 6, EB 69)



/B05/. A materiality threshold of 624 tCO₂e is determined in line with paragraph 10 and paragraph 16(a) of the above guideline.

Based on the above, activities in which risks were assessed were:

1. Monitoring system including the data input procedure
2. Copy of the agreement between household and CPA implementer (origin of data)
3. Stove unique ID system
4. ER sheet (application of data)
5. Data flow
6. Data control procedures
7. Stove efficiency test (WBT) records

In conducting the verification, DOE took cognizance of paragraph 18-23 of "Guideline on the application of materiality in verification" Version 01.0 (Annex 6, EB 69) /B05/ and based on the input of data from different sources checked through sampling of records during OSV observed that no records were found to have inconsistent data from hand written (Copy of the agreement between household and CPA implementer) to the electronic monitoring database. Data flow was checked through comparison of data in hand written forms, electronic database and ER sheet. The data recording input device was also checked and the data compared with the monitoring database and found to be correct.

The risks identified were mitigated through cross check with all sets of documents.

Based on the review of CPA-DD, monitoring report, emission reduction calculation workbook and the data provided and the assessment carried out above, Carbon Check (CCIPL) confirms with a reasonable level of assurance that the claimed emission reductions or removals are free from material errors, omissions or misstatements.

However, CAR-03, CAR-04, CAR-05, CAR-06, CAR-09, CAR-10 and CAR-11 were raised and successfully closed (please refer to appendix B of this report for further details of the CARs and their closure).

3.5 Monitored parameters^(compliance of § 330 eof VVS)

EX-Post Parameters:

Monitoring Parameter Requirement	Assessment/ Observation by the DOE								
Data / Parameter: (as in monitoring plan of CPA-DD):	Efficiency of the system being deployed as part of the project activity (η_{new})								
Measuring frequency/Time Interval:	Annually. CAR 09 had been raised in this regard and has been resolved (Please refer appendix B for closure).								
Reporting frequency:	Annually. CAR 09 had been raised in this regard and has been resolved (Please refer appendix B for closure).								
Reported value:	<table border="1"> <tr> <th>Stove model</th><th>%</th></tr> <tr> <td>CH2200</td><td>33.06%</td></tr> <tr> <td>CH2300</td><td>32.57%</td></tr> <tr> <td>Weighted Average</td><td>32.70%</td></tr> </table>	Stove model	%	CH2200	33.06%	CH2300	32.57%	Weighted Average	32.70%
Stove model	%								
CH2200	33.06%								
CH2300	32.57%								
Weighted Average	32.70%								
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes								
Details of monitoring equipment:	Sampling of the households								
Is accuracy of the monitoring equipment as stated in the CPA-DD? If the CPA-DD does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practise?	CPA DD does not specify the accuracy of the monitoring equipment (thermometer, moisture measuring meter and mass balance). Verification team confirms that the accuracy of the monitoring equipment								



	as stated in the MR represent good monitoring practise based on sectoral expertise.
Calibration frequency /interval: Is it monitoring methodology /CDM EB guidance / local or national standards / manufacturers specification	NA
Is the calibration interval in line with the monitoring plan of the CPA-DD? If the CPA-DD does not specify the frequency of calibration, does the selected frequency represent good monitoring practise?	NA. QA/QC procedures stated in MR comply with CPA-DD.
Company performing the calibration(internal or external calibration):	NA
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	NA
Is (are) calibration(s) valid for the whole reporting period?	NA
If applicable, has the reported data been cross-checked with other available data?	The data has been cross-checked with the WBT test documents.
How were the values in the monitoring report verified?	NA
Does the data management (from data generation to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the data management ensures correct transfer of data and reporting of emission reductions and all necessary QA/QC processes are in place.
In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	NA

Monitoring Parameter Requirement	Assessment/ Observation by the DOE
Data / Parameter: (as in monitoring plan of CPA-DD):	Total number of stoves installed (N_{all})
Measuring frequency/Time Interval:	Continuous
Reporting frequency:	Yearly
Reported value:	9,375 CAR-01 and CAR-04 had been raised in this regard and have been resolved.
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
Details of monitoring equipment:	Sales database
Is accuracy of the monitoring equipment as stated in the CPA-DD? If the CPA-DD does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practise?	An electronic sales database has been maintained for the project activity.
Calibration frequency /interval: Is it monitoring methodology /CDM EB guidance / local or national standards / manufacturers specification	NA
Is the calibration interval in line with the monitoring plan of the CPA-DD? If the CPA-	NA. QA/QC procedures stated in MR comply with CPA-DD.



DD does not specify the frequency of calibration, does the selected frequency represent good monitoring practise?	
Company performing the calibration(internal or external calibration):	NA
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	NA
Is (are) calibration(s) valid for the whole reporting period?	NA
If applicable, has the reported data been cross-checked with other available data?	Yes, the value of parameter has been cross-checked with the monitoring database and sample households and the hard copy records were also checked during the OSV.
How were the values in the monitoring report verified?	NA
Does the data management (from data generation to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the data management ensures correct transfer of data and reporting of emission reductions and all necessary QA/QC processes are in place.
In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	NA

Monitoring Parameter Requirement	Assessment/ Observation by the DOE
Data / Parameter: (as in monitoring plan of CPA-DD):	Stove Operation Fraction – used to determine the share of distributed stoves that are still operating, measured ex-post through sampling (SOF)
Measuring frequency/Time Interval:	Yearly
Reporting frequency:	Yearly
Reported value:	0.6534
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
Details of monitoring equipment:	Value obtained from the monitoring survey of samples
Is accuracy of the monitoring equipment as stated in the CPA-DD? If the CPA-DD does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practise?	NA
Calibration frequency /interval: Is it monitoring methodology /CDM EB guidance / local or national standards / manufacturers specification	NA.
Is the calibration interval in line with the monitoring plan of the CPA-DD? If the CPA-DD does not specify the frequency of calibration, does the selected frequency represent good monitoring practise?	NA. QA/QC procedures stated in MR comply with CPA-DD.
Company performing the calibration(internal or external calibration):	NA



Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	NA
Is (are) calibration(s) valid for the whole reporting period?	NA
If applicable, has the reported data been cross-checked with other available data?	Yes, reported data in MR has been compared with monitoring survey report and the ER sheet
How were the values in the monitoring report verified?	The values in the monitoring report were compared against the values in ER sheet
Does the data management (from data generation to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	<p>Yes, the data management ensures correct transfer of data and reporting of emission reductions and all necessary QA/QC processes are in place.</p> <p><u>For SOF, 190 valid surveys were recorded out of which 125 showed that the users were still using the Envirofit stove, i.e. 65.79% of the sample.</u></p> <p><u>Now for this monitoring period of the PoA, the confidence/precision applicable is 95/10.</u></p> <p><u>Standard error of proportion has been calculated by using the formulae $\sqrt{(1-f)*p*q / n}$:</u></p> <p><u>where, f = sampling fraction</u> <u>p = sample proportion</u> <u>q=1-p</u> <u>n = sample size</u></p> <p><u>This is deemed correct in line with paragraph 31, Appendix 4 of Guideline: Sampling and surveys for CDM project activities and programmes of activities, Version 03.0 /B10/.</u></p> <p><u>Relative precision has been calculated using the formulae $z * \text{standard error of proportion} / \text{fraction of operational stoves}$</u></p> <p><u>This is deemed correct in line with paragraph 38 and 39, Appendix 4 of Guideline: Sampling and surveys for CDM project activities and programmes of activities, Version 03.0 /B10/</u></p> <p><u>The precision achieved is calculated to be 10.15%, which is 0.15% above the required 10%.</u></p> <p><u>Based on paragraph 16 of "Standard for Sampling and surveys for CDM project activities and programme of activities" version 04.1 /B07/, the precision has not been met and option (b), has been applied.</u></p> <p><u>As per paragraph 16 (c) of the above</u></p>



	<p><u>Standard /B07/, paragraph 16 (b) is only eligible for application to the survey undertaken during the first two years of the crediting period of the project activity or CPAs which is satisfied for this PoA monitoring period.</u></p> <p><u>Accordingly PP has applied the option as per paragraph 16 (b), (i), (b) and discounted the sample result by three times the percentage of precision points missed, i.e. $0.15\% \times 3 = 0.45\%$.</u></p> <p><u>Hence PP has correctly subtracted 0.45% from the SOF determined via survey and applied SOF as 65.34% ($65.79 - 0.45$) for emission reduction calculations, -which is conservative hence deemed acceptable.</u></p>
In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	NA.

Monitoring Parameter Requirement	Assessment/ Observation by the DOE
Data / Parameter: (as in monitoring plan of CPA-DD):	The amount of woody biomass consumption that is consumed through the continued use of old stoves (μ_{old})
Measuring frequency/Time Interval:	Annual
Reporting frequency:	Annual
Reported value:	2,657 kg/year
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
Details of monitoring equipment:	Value obtained from monitoring survey of samples
Is accuracy of the monitoring equipment as stated in the CPA-DD? If the CPA-DD does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practise?	NA
Calibration frequency /interval: Is it monitoring methodology /CDM EB guidance / local or national standards / manufacturers specification	NA
Is the calibration interval in line with the monitoring plan of the CPA-DD? If the CPA-DD does not specify the frequency of calibration, does the selected frequency represent good monitoring practise?	NA. QA/QC procedures stated in MR comply with CPA-DD.
Company performing the calibration(internal or external calibration):	NA
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	NA
Is (are) calibration(s) valid for the whole	NA



reporting period?	
If applicable, has the reported data been cross-checked with other available data?	Yes, the value of parameter has been calculated based on 2 other parameters and has been cross-checked with them.
How were the values in the monitoring report verified?	NA
Does the data management (from data generation to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	<p>Yes, the data management ensures correct transfer of data and reporting of emission reductions and all necessary QA/QC processes are in place.</p> <p><u>For the parameter, the amount of woody biomass that continues to be used in the replaced stoves (μ_{old}), data could only be collected out of those sampled users that are still using the baseline cookstoves. During the monitoring activity, 42 stove users were identified using baseline stoves along with project stoves. Out of the same 34 valid surveys were recorded.</u></p> <p><u>The mean value of μ_{old} thus obtained was 2.253 t/year.</u></p> <p><u>Now for this monitoring period of the PoA, the confidence/precision applicable is 95/10.</u></p> <p><u>Standard error of mean is calculated by using the formulae $\sqrt{(1-f)*s^2/n}$:</u></p> <p><u>where, f = sampling fraction</u> <u>s = standard deviation</u> <u>n = sample size</u></p> <p><u>This is deemed correct in line with paragraph 11, Appendix 4 of Guideline: Sampling and surveys for CDM project activities and programmes of activities, Version 03.0 /B10/</u> <u>Precision reliability is calculated using the formulae $z * \text{standard error of mean} / \text{mean}$</u></p> <p><u>This is deemed correct in line with paragraph 16 and 17, Appendix 4 of Guideline: Sampling and surveys for CDM project activities and programmes of activities, Version 03.0 /B10/</u></p> <p><u>The precision achieved by the sample has been calculated as 17.91% and thus the desired 10% precision is not met.</u></p> <p><u>Based on paragraph 16 of "Standard for Sampling and surveys for CDM project activities and programme of activities" version 04.1 /B07/, the precision has not been met and option (b) has been</u></p>



	<p><u>applied.</u></p> <p><u>As per paragraph 16 (c) of the above Standard /B07/, paragraph 16 (b) is only eligible for application to the survey undertaken during the first two years of the crediting period of the project activity or CPAs which is satisfied for this PoA monitoring period.</u></p> <p><u>Accordingly PP has applied the option as per paragraph 16 (b), (i), (a) and taken the higher bound value which is conservative.</u></p> <p><u>The higher bound value is calculated by using the formulae = mean + (Standard error or mean * z value) = 2.657 t/year which is conservative and hence deemed acceptable as per paragraph 84, Appendix 4 of Guideline: Sampling and surveys for CDM project activities and programmes of activities, Version 03.0 /B10/.</u></p>
In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	NA

Monitoring Parameter Requirement	Assessment/ Observation by the DOE
Data / Parameter: (as in monitoring plan of CPA-DD):	The fraction of end users that are still using baseline (replaced) stoves (f_{old})
Measuring frequency/Time Interval:	Annual
Reporting frequency:	Annual
Reported value:	53.62%
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
Details of monitoring equipment:	Value obtained from monitoring survey of samples
Is accuracy of the monitoring equipment as stated in the CPA-DD? If the CPA-DD does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practise?	NA
Calibration frequency /interval: Is it monitoring methodology /CDM EB guidance / local or national standards / manufacturers specification	NA
Is the calibration interval in line with the monitoring plan of the CPA-DD? If the CPA-DD does not specify the frequency of calibration, does the selected frequency represent good monitoring practise?	NA. QA/QC procedures stated in MR comply with CPA-DD.
Company performing the calibration(internal or external calibration):	NA



Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	NA
Is (are) calibration(s) valid for the whole reporting period?	NA
If applicable, has the reported data been cross-checked with other available data?	Yes, reported data in MR has been compared with monitoring survey report and the ER sheet
How were the values in the monitoring report verified?	NA
Does the data management (from data generation to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	<p>Yes, the data management ensures correct transfer of data and reporting of emission reductions and all necessary QA/QC processes are in place.</p> <p><u>96 of the 125 surveys where Envirofit stoves were still in operation provided valid results on the use of baseline stoves along with the Envirofit stoves. Of the 96 samples, 54 of them were not using the baseline stoves, i.e. 56.25% of the total.</u></p> <p><u>Now for this monitoring period of the PoA, the confidence/precision applicable is 95/10.</u></p> <p><u>Standard error of proportion is calculated by using the formulae $\sqrt{(1-f)*pq/n}$:</u></p> <p><u>where, f = sampling fraction</u> <u>p = sample proportion</u> <u>q=1-p</u> <u>n = sample size</u></p> <p><u>This is deemed correct in line with para 31, Appendix 4 of Guideline: Sampling and surveys for CDM project activities and programmes of activities, Version 03.0 /B10/</u></p> <p><u>The Relative precision has been calculated using the formulae $z * \text{standard error of proportion} / \text{fraction of operational stoves}$</u></p> <p><u>This is deemed correct in line with paragraph 38 and 39, Appendix 4 of Guideline: Sampling and surveys for CDM project activities and programmes of activities, Version 03.0 /B10/</u></p> <p><u>The precision achieved by the sample is calculated to be 17.55%, which exceed the required precision of 10%.</u></p> <p><u>Based on paragraph 16 of "Standard for Sampling and surveys for CDM project activities and programme of activities" version 04.1 /B07/, the precision has not been met and option (b), has been</u></p>



	<p><u>applied.</u></p> <p><u>As per paragraph 16 (c) of the above Standard /B07/, paragraph 16 (b) is only eligible for application to the survey undertaken during the first two years of the crediting period of the project activity or CPAs which is satisfied for this PoA verification.</u></p> <p><u>Accordingly PP has applied the option as per paragraph 16 (b), (i), (a) and taken the lower bound value for the households not using the baseline stoves.</u></p> <p><u>Hence PP has correctly calculated this values as $\{56.25\% - (z * \text{standard error of proportion})\} = 56.25\% - (1.96 * 5.04\%) = 46.38\%$.</u></p> <p><u>Accordingly the fraction of users still using the baseline stoves has been calculated using the formula $f_{old} = 1 - f_{non,old}$, = 53.62% and this is conservative and hence deemed acceptable by the verification team.</u></p>
In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	NA

Monitoring Parameter Requirement	Assessment/ Observation by the DOE
Data / Parameter: (as in monitoring plan of CPA-DD):	Calculated average stove operation years in the monitoring period (Stove_{year})
Measuring frequency/Time Interval:	Annual
Reporting frequency:	Annual
Reported value:	0.87
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
Details of monitoring equipment:	Value obtained from monitoring survey of samples
Is accuracy of the monitoring equipment as stated in the CPA-DD? If the CPA-DD does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practise?	NA
Calibration frequency /interval: Is it monitoring methodology /CDM EB guidance / local or national standards / manufacturers specification	NA.
Is the calibration interval in line with the monitoring plan of the CPA-DD? If the CPA-DD does not specify the frequency of calibration, does the selected frequency	NA. QA/QC procedures stated in MR comply with CPA-DD.



represent good monitoring practise?	
Company performing the calibration(internal or external calibration):	NA
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	NA
Is (are) calibration(s) valid for the whole reporting period?	NA
If applicable, has the reported data been cross-checked with other available data?	Yes, reported data in MR has been compared with monitoring survey report and the ER sheet
How were the values in the monitoring report verified?	Yes, reported data in MR has been compared with monitoring survey report and the ER sheet
Does the data management (from data generation to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the data management ensures correct transfer of data and reporting of emission reductions and all necessary QA/QC processes are in place.
In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	NA.

EX-Ante Parameters:

Parameter	Annual average biomass consumption per appliance (Q_{biomass})
Data unit:	tonnes/year
Default values used:	4.36
Purpose of data	Baseline emissions calculation
Source and Verification of the source	The value of this parameter is fixed ex-ante /B04/.

Parameter	Fraction of woody biomass saved by the project activity in year y that can be established as non-renewable biomass. ($f_{\text{NRB},y}$)
Data unit:	Fraction
Default values used:	0.99
Purpose of data	Baseline emissions calculation
Source and Verification of the source	The value of this parameter is fixed ex-ante /B04/.

Parameter	Net calorific value of the non-renewable biomass that is substituted ($\text{NCV}_{\text{biomass}}$)
Data unit:	TJ/tonne
Default values used:	0.015
Purpose of data	Baseline emissions calculation
Source and Verification of the source	The value of this parameter is fixed ex-ante /B04/.

Parameter	Emission factor for the substitution of non-renewable biomass by similar consumers ($\text{EF}_{\text{projected fossilfuel}}$)
-----------	--



Data unit:	tCO ₂ /TJ
Default values used:	81.6
Purpose of data	Baseline emissions calculation
Source and Verification of the source	The value of this parameter is fixed ex-ante /B04/.

Parameter	Efficiency of the system being replaced (fraction) (η_{old})
Data unit:	Fraction
Default values used:	0.101
Purpose of data	Baseline emissions calculation
Source and Verification of the source	The value of this parameter is fixed ex-ante /B04/.

Parameter	Net to gross adjustment factor to account for leakages (LAF)
Data unit:	Fraction
Default values used:	0.95
Purpose of data	Baseline emissions calculation
Source and Verification of the source	The value of this parameter is fixed ex-ante /B04/.

In summary, the verification team confirms that all the ex-ante and ex-post parameters are monitored in accordance with the approved monitoring plan and applied methodology. The verification took cognizance of § 251 and 252 of CDM Project Standard and § 270,278 to 291 of VVS version 07/B01/.

3.6 Monitoring responsibility

As outlined in section B.6.1 of CPA-DD/B02/ and section C of MR, monitoring shall be done by the CPA implementer, CEESD by means of sales database. The data is further periodically checked by the CME to ensure there is no double counting.

In order to ensure completeness and accuracy of monitoring information, electronic database(s) is operated and maintained by CEESD. This information is further maintained by the CME who verify the reported sales with the number of stoves produced by the manufacturer. Since the unique code inscribed on the cook stoves will correspond to its CPA, the occurrence of double counting is avoided.

The unique serial numbering system and the data from manufacturer was cross-checked during the site visit on a sampling basis.

It was confirmed during the OSV and by checking the monitoring system that all the roles and responsibilities related to monitoring are fulfilled by representatives of CME and the CPA implementer.

The responsibilities and authorities for monitoring and reporting are in accordance with the responsibilities and authorities stated in the monitoring plan/B04/.

The details about monitoring system with the diagrams have been provided in Section C of the monitoring report /02/. The data flow and management and reporting structure was also checked during the site visit.

However, CAR-03 had been raised in this regard and has been resolved (Please refer Appendix B for closure).



3.6.1 Accuracy of equipment

Only CPA 1 was operational during the monitoring period. Sales database has been used to record the stoves details by the CPA implementer and the CME through a survey of the installed stoves based on sampling basis. The stove efficiency also needs to be checked. CL 01 had been raised in this regard and has been resolved (Please refer Appendix B for detailed closure. The stove efficiency testing has been done by WBTs conducted in line with the guidance provided by the CME and according to a methodology supported by PCIA. The appropriate QA/QC procedures have been followed for the monitoring parameters. The verification took cognizance of § 282 of VVS version 07/B01/.

3.7 Deviation from and/or Revision of the registered monitoring plan

There are no deviations from and/or revisions to the monitoring plan during the monitoring period.

3.8 Assessment of data and calculation of greenhouse gas emission reductions (compliance of § 330 d (iv) of VVS)

In line with the requirement of § 330 d (iv) of VVS, verification team has reviewed the Monitoring report /01/ and ER spread sheet /04/ to check the arithmetic calculation of the emission reductions. The equation used for the calculation is compared with those provided in the registered CPA-DD/B04/ and the methodology AMS-II.G, version 03 /B02/ and found to be in correct. Verification team further noted that for the monitoring parameters “SOF”, “ μ_{old} ” and “ f_{old} ”, the desired precision of 10% was not met and hence correction have been applied for these parameters in a conservative manner as per the revised approved PoA-DD /B04/.

However, CAR-07, CAR-08 and CAR-12 were raised and successfully closed (Please refer Appendix B for details of the CARs and their closure).

3.8.1 Baseline emissions

The equations for baseline emissions as provided in the monitoring report/01/ and confirmed with the registered CPA-DD/B04/ and the methodology AMS-II.G, version 03 /B02/ are:

$$ER_y = B_{y,savings} \times f_{NRB,y} \times NCV_{biomass} \times EF_{projected_fossilfuel}$$

Where:

ER_y	=Emission reductions during the year y in tCO ₂ e
$B_{y,savings}$	=Quantity of biomass that is saved in tonnes
$f_{NRB,y}$	=Fraction of biomass saved by the project activity in year y that can be established as non-renewable biomass using survey results, national or local statistics or other sources of information (fixed ex ante as 99%)
$NCV_{biomass}$	= Net calorific value of the non-renewable biomass that is substituted (IPCC default for wood fuel, 0.015 TJ/tonne)
$EF_{projected_fossilfuel}$	= Emission factor for the substitution of non-renewable biomass by similar consumer (Default 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 biomass used in the absence of the project activity in tonnes/year
η_{old}	=Efficiency of the system being replaced (fixed 10.1% ex ante)
η_{new}	=Efficiency of the system being deployed as part of the project activity (32.7% monitored ex post during the monitoring period)



$$B_{old} = LAF \cdot N_{all} \cdot SOF \cdot (Q_{biomass} - \left(\frac{\mu_{old}}{1000} \cdot f_{old} \right)) \cdot Stove_{year}$$

LAF	=Net to gross Adjustment factor (0.95) applied in accordance with paragraph 13 and 23 of AMS-II.G v. 03
N _{all}	=Total number of stoves installed (9,375 monitored ex post during the monitoring period)
SOF	=Stove Operation Fraction - % of stoves operating or replaced by equivalent in-service appliance (65.34% monitored ex post during the monitoring period)
Q _{biomass}	= Average annual biomass consumption per appliance (4.3 tonnes / year fixed ex -ante).
μ _{old}	=Average amount of woody biomass consumption that is consumed through the continued use of old stoves (2,657 kg/year monitored ex post)
f _{old}	=Fraction of end users that are still using their replaced stoves during the monitoring period (53.62% monitored ex post during the monitoring period)
Stove _{year}	= Calculated average stove operation years in the monitoring period (0.87 monitored ex post for the monitoring period)

From the above equation and the parameter values, B_{old} is calculated as 14,820 tonnes

Hence B_{y,savings} = 10,242 tonnes
ER_y = 12,472 tCO₂e

3.8.2 Project emissions

There are no project emissions identified in the monitoring methodology /B02/ and the CPA-DD /B04/.

3.8.3 Leakage emissions

A default (0.95) Net to gross adjustment factor to account for leakages (LAF) has been considered by the project and thus it is in line with the requirement of monitoring methodology /B02/ and the CPA-DD /B04/.

Verification team confirms that all parameters are used correctly in the calculations, all results are verifiable and transparent, all assumptions are described and based on verifiable evidence and calculations are done in accordance with the pre-defined formulae from registered CPA-DD. The total number of CERs achieved during the monitoring period is 12,472 tCO₂e.

3.9 Assessment of actual emission reductions with the estimate emission reductions in CPA DD(s)

Estimated Emission Reduction as per Registered(included)/Approved CPA DD for the monitoring period:	CPA00001 GHG emission reductions: 15,477 tCO ₂ e CPA00002 GHG emission reductions: 5,666 tCO ₂ e CPA00003 GHG emission reductions: 1,803 tCO ₂ e
Actual Emission Reduction for the Monitoring Period	CPA00001 GHG emission reductions: 12,472 tCO ₂ e CPA00002 GHG emission reductions: 0 tCO ₂ e CPA00003 GHG emission reductions: 0 tCO ₂ e
Has any increase of CER's occurred?	No
Reason for Increase of CER's	NA

In summary, verification team confirms that actual emission reduction is lower than the estimate of the registered (included)/approved CPA-DD for the current monitoring period.



The verification took cognizance of § 290(c) of VVS version 07/B01/.

However, CL-02 was raised and successfully closed (Please refer to appendix B of the report for the details of the CL and its closure).

3.10 Issues remaining from the previous verification period or during validation (compliance of § 330 h of VVS)

The reported monitoring period is the first verification. There are no issues remaining from the validation. The verification took cognizance of [paragraph 330 h](#) of VVS version 07/B01/.

3.11 Quality and Management System Assurance

Verification team evaluated the management systems in place to implement the monitoring of the project activity. This included the roles and responsibilities, data collection, transfer and aggregation procedures, data storage and archiving for the monitoring system.

Diagrams of the roles and responsibilities data collection transfer and aggregation procedures, data storage and archiving for the monitoring system have been provided in section C of the MR.

The verification team confirms that the monitoring management system of the CDM project is in place; with the responsibilities properly identified and in place.



Field Code Changed

APPENDIX A

CARBON CHECK Certification statement for the Verification Report **CCL223ENVIROFIT/VER/01/GHANA** (Compliance of § 332 of VVS)

Carbon Check (India) Private Ltd., the DOE, has performed the verification of the registered Programme of Activities “UNFCCC Registration Number 5342”, “African Improved Cooking Stoves Programme of Activities” in Ghana. The component project activity of the Programme of Activity is designed to generate emission reductions by distribution of the fuel-efficient charcoal based cook stoves in Ghana. The fuel-efficient cook stoves are replacing the baseline charcoal stoves in common use (baseline scenario). The CME and CPA implementer are responsible for the collection of data in accordance with the monitoring plan and the reporting of GHG emissions reductions from the component project activity/ies. It is DOE’s responsibility to express an independent verification statement on the reported GHG emission reductions from the component project/s. The DOE does not express any opinion on the selected baseline scenario or on the validated and registered PoA-DD/CPA-DD. The verification is carried out in-line with the VVS requirements.

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

The verification is based on:

- PoA-DD version 4.3 dated 07/06/2014;
- CPA-DD/s included in the registered PoA and its monitoring plan for the monitoring period 15/12/2012 to 14/12/2013.
- Approved monitoring methodology AMS-II.G “Energy efficiency measures in thermal applications of non-renewable biomass”, version 03;
- Validation report /B04/ for the PoA and CPA/s;
- Monitoring report(s) version(s) 1.2, 1.3, 1.4, 1.5, ~~and 2.0, and 3.0~~ dated 08/09/2014, 13/10/2014, 18/11/2014, 21/11/2014, ~~and 17/12/2014~~ and 17/03/2015 respectively).

This statement covers verification period of 365 days between 15-12-2012 and 14-12-2013.

The DOE has raised 02 clarification and 13 corrective action requests, all of which have been successfully resolved by PP(s).

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

The DOE , hereby certifies that the project activity, achieved emission reductions by sources of GHG equal to 12,472 tCO₂ equivalent and all monitoring requirements have been fulfilled and is substantiated by an audit trail that contains evidence and records. The break-up of emission reduction up-to 31/12/2012 and 01/01/2013 onwards as verified during the course of verification are as below:



Item	Emission reductions up to 31 December 2012	Emission reductions from 1 January 2013 onwards
Emission reductions (t CO ₂ e)	458	12,014

20145-4203-30227

Date

Amit Anand

Final Approver

Carbon Check (India) Private Ltd.

20145-0342-493027

Date

Anubhav Dimri

Team Leader

Carbon Check (India)

Private Ltd.



APPENDIX B

Photographic Evidences





APPENDIX C

Carbon Check CDM Verification Protocol

“African Improved Cooking Stoves Programme of Activities” in Ghana, Nigeria and Liberia

Report No. CCL223ENVIROFIT/VER/01/GHANA



Carbon Check's Checklist question	Ref.	MoV ⁴	Findings, comments, references, data sources	Draft conclusion	Final conclusion
1. Project implementation					
1.1 Have all physical features proposed in the registered/included CPA DD been implemented at the project site? § 244 of CDM Project Standard and § 270 (a), 271 (a), 272 and 263 (a) of VVS version 07.	/1/ /B04/	DR, I	<p>Yes, all the physical features as proposed in the registered/included CPA-DD have been implemented. The CPA-DD involves distribution of more efficient charcoal cook stoves. The following models i.e., CH2200, CH2300 and CH400 of efficient ICS were to be implemented in the CPA0001 during this monitoring period. However, as stated in the MR, only stoves of model types CH2200 and CH2300 were distributed during this monitoring period under CPA0001 and stoves for model CH4400 have not been distributed or implemented. CPA0002 and CPA0003 were not implemented during this monitoring period and no emission reductions are being claimed for these two CPA.</p> <p>However, no information has been provided in either section A.1 of B.1 of monitoring report on total number of stoves installed under CPA0001 for this monitoring period. Also CPA0002 and CPA0003 were not included in this verification although their crediting period overlapped with this monitoring period. CAR 01 had been raised in this regard.</p>	CAR-01	OK

⁴MoV = Means of Verification, DR= Document Review, I= Interview, www = internet search.



			In response to the CAR raised PP has submitted revised MR stating the number of stoves with model implemented during the monitoring period. Also CPA0002 and CPA0003 were included in this verification without claiming any emission reductions for these two CPA. CAR was closed.		
1.2 Has the component project activity been operated in accordance with the project scenario described in the registered/included CPA-DD? Reference: §245 of CDM Project Standard (version 07.0) and § 270 (a), 271 (a) and 272 of VVS (version 07.0).	/1/ /B04/	DR, I	Yes, the component project activity has been operated in accordance with the project scenario described in the registered/included CPA-DD and relevant guidance.	OK	OK
1.3 If the component project activity is implemented on a number of different locations, has the Monitoring report provided the verifiable starting dates for each site? Reference: § 248 (b) of CDM Project Standard (version 07.0) and 273 (a) of VVS (version 07.0).	/1/ /2/ /5/ /6/ /B04/	DR, I	The emission reduction spreadsheet has provided start date of installation and operation for each of the cook stoves distributed in the CPA. The start date of the CPA is 03/01/2012. All the stoves have been installed after this date.	OK	OK
1.4 Is the start date of monitoring period consistent?	/1/ /2/	DR	Yes, start date of the monitoring period is consistent in the MR and the ER sheet.	OK	OK
1.5 Is the monitoring report consistently filled with respect to all sections as required by its guideline of filling the monitoring report? Reference: § 260, 261 of CDM Project Standard (version 07.0) and § 270 (b) of VVS (version 07.0).	/1/ /B01/ /B03/	DR	The MR form uses the latest applicable version of the Monitoring report form (version 04.0). However, certain sections of MR do not meet the “Instructions for filling out the monitoring report form (version 04.0)” in accordance with §251 of PS (version 07.0). Hence, CAR 02 had been raised in the same regard. Furthermore, Section C of the MR doesn't provide information on organizational	CAR-02 CAR-03 CAR-13	OK



			<p>structure, roles and responsibilities of personnel, and emergency procedures for the monitoring system in accordance with requirements stipulated under §242 of PS (Version 07.0).</p> <p>Hence, CAR 03 has been raised in the same regard.</p> <p>Moreover, the information provided on host party(ies) in MR is not consistent with that provided in approved revised PoA-DD.</p> <p>Hence CAR 13 had been raised in this regard.</p> <p>PP submitted revised MR with detailed technical features of the project, organization structure along with roles and responsibilities and Host parties of the PoA. Hence the CARs were closed.</p>		
1.6 Do the CERs obtained for the monitoring period within the limit of estimate in the registered/included CPA DD? Is the claimed CER's justifiable?	/1/ /2/	DR, I	<p>In section E.7 and on the cover page of MR, a value of 686 tCO₂eq has been provided for actual GHG emission reductions achieved during the period up to 31 December 2012.</p> <p>However, the calculation of the same is not provided in Emission Reduction spreadsheet (2014 08 14 EF GHN ER calculations CLEAN v01.xlsx) and hence, it is not clear how PP arrived at this value.</p> <p>CL 02 has been raised in this regard. The CL was closed after PP submitted revised ER spread sheet providing break up of emission reduction calculations. Hence the CL was</p>	CL-02	OK



			closed.		
1.7 Is the monitoring system provided in line diagrams showing all relevant monitoring points?	/1/	DR	CAR 03 has been raised in this regard. Please refer to section 1.5 of the protocol above.	CAR-03	OK
2. Monitoring plan and methodology					
2.1 Is the monitoring plan established in accordance with the monitoring methodology? § 251 of CDM Project Standard (version 07.0) and § 274 of VVS (version 07.0).	/1/ /B04/	DR, I	Yes, the monitoring plan has been established in accordance with the applied monitoring methodology i.e., AMS-II.G (version 03.0).	OK	OK
2.2 In case the implemented monitoring plan defers from the monitoring methodology, has any requests for revision to or deviation from the monitoring methodology been officially communicated to the CDM EB? § 253 of CDM Project Standard and § 296 of VVS (version 07.0).	/1/ /B04/	DR, I,	NA	OK	OK
2.2.1 Have the above changes to the monitoring plan been approved by the CDM EB?	/1/ /B04/	DR, I,	NA	OK	OK
3. Monitoring and the monitoring plan					
3.1 Is monitoring established in full compliance with the monitoring plan, contained in the registered/included CPA-DD (or new monitoring plan approved by the CDM EB)? §246 of CDM Project Standard (version 07.0) and § 278 of VVS (version 07.0).	/1/ /B04/	DR, I	No, the monitoring has not been established in full compliance with the monitoring plan as contained in the section B.7.1 of approved revised PoA-DD (part II). Hence CAR 04, 09, 10 and 11 had been raise in this regard. The CARs were closed after PP submitted revised MR with corrections in line with the PoA-DD/CPA-DD with respect to GHG	CAR-04 CAR-09 CAR-10 CAR-11	OK



			sources / sinks, measuring frequency, QA/QC procedures and purpose of data for the monitoring parameters.		
3.2 Are all baseline emission parameters monitored and updated in accordance with monitoring plan, monitoring methodology and relevant CDM EB decisions?	/1/ /B04/	DR, I	CAR 04, 09, 10 and 11 had been raise in this regard. Please refer to section 3.1 of the protocol.	CAR 04 CAR 09 CAR 10 CAR 11	OK
3.2.1 Was the monitoring equipment for baseline emission parameters controlled and monitoring results recorded as per approved frequency?	/1/ /B04/	DR, I	CAR 04, 09, 10 and 11 had been raise in this regard. Please refer to section 3.1 of the protocol.	CAR 04 CAR 09 CAR 10 CAR 11	OK
3.2.2 Was the monitoring equipment for baseline emission parameters calibrated in accordance with QA&QC procedures described in the registered monitoring plan?	/1/ /B04/	DR, I	CAR 04, 09, 10 and 11 had been raise in this regard. Please refer to section 3.1 of the protocol.	CAR 04 CAR 09 CAR 10 CAR 11	OK
3.3 Are all project emission parameters monitored and updated in accordance with monitoring plan, monitoring methodology and relevant CDM EB decisions?	/1/ /B02/ /B04/	DR, I	No, project emissions have been identified in the CPA; this is in line with the methodology AMS-II.G, version 03.	OK	OK
3.3.1 Was the monitoring equipment for project emission parameters controlled and monitoring results recorded as per approved frequency?	/1/ /B02/ /B04/	DR, I	NA	OK	OK
3.3.2 Was the monitoring equipment for project emission parameters calibrated in accordance with QA&QC procedures described in the registered monitoring plan?	/1/ /B02/ /B04/	DR, I	NA	OK	OK



3.4	Are all leakage emission parameters monitored and updated in accordance with monitoring plan, monitoring methodology and relevant CDM EB decisions?	/1/ /B02/ /B04/	DR, I	To calculate leakage emissions net to gross adjustment factor (LAF) has been used. The value of the parameter has been fixed ex-ante and does not require monitoring in line with the monitoring methodology, AMS-II.G, version 03.	OK	OK
3.4.1	Was the monitoring equipment for leakage emission parameters controlled and monitoring results recorded as per approved frequency?	/1/ /B02/ /B04/	DR, I	NA	OK	OK
3.4.2	Was the monitoring equipment for leakage emission parameters calibrated in accordance with QA&QC procedures described in the registered monitoring plan?	/1/ /B02/ /B04/	DR, I	NA	OK	OK
3.5	Were all monitoring parameters available and verifiable through the whole monitoring period?	/1/ /B04/	DR, I	Yes, all the monitoring parameters were available and verifiable through the whole monitoring period.	OK	OK
3.5.1	In case, only partial monitoring data is available and PP(s) /CPA implementer provide estimations or assumptions for the rest of data, was it possible to verify those estimations and assumptions?	/1/ /B04/	DR, I	Yes, complete set of data is available for the monitoring period.	OK	OK
3.6	Was management and operation system established and operated in accordance with the monitoring plan and provisions of registered PoA?	/1/ /B04/	DR, I	CAR 03 had been raised in the same regard. The CAR was closed after PP submitted MR with revision in section C.	CAR-03	OK
3.7	Was it possible to verify that involved management and operation personnel are fully aware of the responsibilities and perform all operations according to the registered monitoring plan and internally developed	/1/ /B04/	DR, I	CAR 03 had been raised in the same regard. The CAR was closed after PP submitted MR with revision in section C.	CAR-03	OK



manuals?					
3.8 Does the monitoring system provide organizational structure, role and responsibilities, emergency procedures?	/1/ /B04/	DR, I	CAR 03 had been raised in the same regard. The CAR was closed after PP submitted MR with revision in section C.	CAR-03	OK
3.9 Does any uncertainties identified and addressed?	/1/ /B04/	DR, I	Yes, uncertainties were identified in MR and ER sheet. Hence CAR 05, 06, 07, 08, 12 and CL 02 were raised in this regard. The above CARs and CL were closed out after appropriate revision in the MR and ER spread sheet.	CAR-05 CAR-06 CAR-07 CAR-08 CAR-12 CL-02	OK
4. Parameters					
4.1.1 Monitored parameter Title: η_{new} Description: Efficiency of the system being deployed as part of the project activity Units: Efficiency Estimated value (<i>ex-ante</i>): 36.3 % Measured value (<i>ex-post</i>): 32.7 %	/1/ /3/ /B04/	DR, I	CAR 05, 06, 07, 08 and CL 01 had been raised in this regard. The above CARs and CL were closed out after PP submitted revised MR and ER spread sheet with appropriate corrections and explanation in response to the queries raised. Please refer to Findings section below the protocol in appendix B of this report for further details of the CARs and CL and their closure.	CAR-05 CAR-06 CAR-07 CAR-08 CL-01	OK
4.1.2 Monitored parameter Title: N_{all} Description: Total number of stoves installed Units: Number Estimated value (<i>ex-ante</i>): 4,500 Measured value (<i>ex-post</i>): 9,375	/1/ /3/ /B04/	DR, I	CAR 01, CAR 05 and CL 01 had been raised in this regard. In response to the issues raised it was clarified that the CPA involved distribution and installation of 9,446 stoves till the end of the monitoring period. But during the monitoring it was found that information for	CAR-01 CAR-05 CL-01	OK



			<p>71 stoves could not be found and hence these were treated as non responsive and not counted in the CPA. Hence total number of cook stoves considered under the CPA during the monitoring and for emission reduction calculation is 9,375.</p> <p>Also even due to increase in the stove numbers as compared to that stated in the CPA-DD, it was found that the project still remained under the micro-scale limit of 60,000 MWh_{th} per annum and hence it was deemed acceptable. Hence the above CARs and CL were closed.</p>		
<p>4.1.3 Monitored parameter Title: SOF Description: Stove Operation Fraction – used to determine the share of distributed stoves that are still operating, measured ex-post through sampling Units: Fraction Estimated value (<i>ex-ante</i>): 95% Measured value (<i>ex-post</i>): 65.34%</p>	/1/ /3/ /B04/	DR, I	<p>CAR 05, 06, 07 and CL 01 had been raised in this regard.</p> <p>The CARs and CL were closed out after PP submitted revised MR and ER spread sheet. Please refer to Findings section below the protocol in appendix B of this report for further details of the CARs and CL and their closure.</p>	<p>CAR 05 CAR 06 CAR 07 CL 01</p>	OK
<p>4.1.4 Monitored parameter Title: μ_{old} Description: Quantity of biomass saved per stove per annum Units: kg/year Estimated value (<i>ex-ante</i>): 217.8 kg/year Measured value (<i>ex-post</i>): 2,657 kg/year</p>	<u>/1/ /3/ /B04/</u>	<u>DR, I</u>	<p>CAR 05, 06, 07, 12 and CL 01 had been raised in this regard.</p> <p>The CARs and CL were closed out after PP submitted revised MR and ER spread sheet. Please refer to Findings section below the protocol in appendix B of this report for further details of the CARs and CL and their closure.</p>	<p>CAR 05 CAR 06 CAR 07 CAR 12 CL 01</p>	OK
<p>4.1.5 Monitored parameter</p>	<u>/1/ /3/ /B04/</u>	<u>DR, I</u>	<p>CAR 05, 06, 07 and CL 01 had been raised in this regard.</p>	CAR 05	OK



<p>Title: f_{old}</p> <p>Description: The fraction of end users that are still using baseline (replaced) stoves</p> <p>Units: Fraction</p> <p>Estimated value (<i>ex-ante</i>): 0.1</p> <p>Measured value (<i>ex-post</i>): 53.62%</p>			<p>The CARs and CL were closed out after PP submitted revised MR and ER spread sheet. Please refer to Findings section below the protocol in appendix B of this report for further details of the CARs and CL and their closure.</p>	<p>CAR-06</p> <p>CAR-07</p> <p>CL-01</p>	
<p>4.1.6 Monitored parameter</p> <p>Title: Stove_{year}</p> <p>Description: Calculated average stove operation years in the monitoring period.</p> <p>Units: year</p> <p>Estimated value (<i>ex-ante</i>): 1.0</p> <p>Measured value (<i>ex-post</i>): 0.87</p>	<p>/1/ /3/</p> <p>/B04/</p>	<p>DR, I</p>	<p>CL 01 had been raised in this regard. The CL was closed out after PP submitted revised MR and ER spread sheet. Please refer to Findings section below the protocol in appendix B of this report for further details of the CARs and CL and their closure.</p>	<p>CL-01</p>	<p>OK</p>
<p>4.2.1 Default (ex-ante) parameter</p> <p>Title: $Q_{biomass}$</p> <p>Description: Annual average biomass consumption per appliance</p> <p>Units: Tonnes/year</p> <p>Default/Used value: 4.36</p>	<p>/1/ /3/</p> <p>/B04/</p>	<p>DR, I</p>	<p>Value of the parameter has been fixed ex-ante. This has been cross-checked with CPA-DD. The applied value is acceptable to the verification team.</p>	<p>OK</p>	<p>OK</p>
<p>4.2.2 Default (ex-ante) parameter</p> <p>Title: $f_{NRB,y}$</p> <p>Description: Fraction of woody biomass saved by the project activity in year y that can be established as non-renewable biomass.</p> <p>Units: Fraction</p> <p>Default/Used value: 0.99</p>	<p>/1/ /3/</p> <p>/B04/</p> <p>/B08/</p>	<p>DR, I</p>	<p>Value of the parameter has been fixed ex-ante. This has been cross-checked with CPA-DD and the default value for the host-country. The applied value is acceptable to the verification team.</p>	<p>OK</p>	<p>OK</p>
<p>4.2.3 Default (ex-ante) parameter</p>	<p>/1/ /3/</p>	<p>DR, I</p>	<p>Value of the parameter has been fixed ex-</p>	<p>OK</p>	<p>OK</p>



<p>Title: η_{old}</p> <p>Description: Efficiency of the system being replaced</p> <p>Units: Fraction</p> <p>Default/Used value: 0.101</p>	/B02/ /B04/		<p>ante. This has been cross-checked with CPA-DD and the applied methodology.</p> <p>The applied value is acceptable to the verification team.</p>		
<p>4.2.4 Default (ex-ante) parameter</p> <p>Title: $NCV_{biomass}$</p> <p>Description: Net calorific value of the non-renewable biomass that is substituted</p> <p>Units: TJ/Tonne</p> <p>Default/Used value: 0.015</p>	/1/ /3/ /B02/ /B04/	DR, I	<p>Value of the parameter has been fixed ex-ante. This has been cross-checked with CPA-DD and the applied methodology.</p> <p>The applied value is acceptable to the verification team.</p>	OK	<u>OK</u>
<p>4.2.5 Default (ex-ante) parameter</p> <p>Title: $EF_{projected_fossilfuel}$</p> <p>Description: Emission factor for the substitution of non-renewable biomass by similar consumers</p> <p>Units: tCO_2/TJ</p> <p>Default/Used value: 81.6</p>	/1/ /3/ /B02/ /B04/	DR, I	<p>Value of the parameter has been fixed ex-ante. This has been cross-checked with CPA-DD and the applied methodology.</p> <p>The applied value is acceptable to the verification team.</p>	OK	<u>OK</u>
<p>4.2.6 Default (ex-ante) parameter</p> <p>Title: LAF</p> <p>Description: Net to gross adjustment factor to account for leakages</p> <p>Units: Fraction</p> <p>Default/Used value: 0.95</p>	/1/ /3/ /B02/ /B04/	DR, I	<p>Value of the parameter has been fixed ex-ante. This has been cross-checked with CPA-DD and the applied methodology.</p> <p>The applied value is acceptable to the verification team.</p>	OK	<u>OK</u>
<p>4.3 If any parameter of interest is opting for sampling approach as per the provision in PoA DD and CPA DD, how the DOE has verified the sampling plan and sample records of the PP?</p>	/1/ /3/ /B04/ /B07/	DR, I	<p>CAR 06 had been raised in this regard.</p> <p>Please refer to Findings section below the protocol in appendix B of this report for</p>	CAR-06	OK



Please provide detailed answer. Refer annex 6 of EB 74 and 8 of EB 75 and provide detailed assessment. Please pay particular attention to appendix C (acceptance sampling) of annex 8 of EB 75.			further details of the CAR and its closure.		
5. Calculations					
5.1 Have all the calculations related to the baseline emissions been carried according to the formulae and methods described in the registered/included CPA-DD and applied methodology? § 246 of CDM Project Standard (version 07.0) and § 290 (c) of VVS (version 07.0).	/1/ /3/ /B04/	DR, I	CAR 07, 08, 12 and CL 02 have been raised in this regard. Please refer to Findings section below the protocol in appendix B of this report for further details of the CARs and the CL and their closure.	CAR 07 CAR 08 CAR 12 CL 02	OK
5.2 Have all the calculations related to the project emissions been carried according to the formulae and methods described in the registered/included CPA DD and applied methodology?	/1/ /3/ /B04/	DR, I	No project emissions are associated with the project activity.	OK	OK
5.3 Have all the calculations related to the leakage emissions been carried according to the formulae and methods described in the registered/included CPA DD and applied methodology?	/1/ /3/ /B04/	DR, I	Please refer to section 3.4 of the protocol above.	OK	OK
6. PoA Specific checklist question					
6.1 Has the DOE identified those CPAs that it shall consider for verification in accordance with the method/procedure to be used for verification of the amount of reductions of anthropogenic emissions by sources or removals by sinks of greenhouse	/1/ /3/ /B04/	DR, I	Initially PP had submitted only one CPA for verification although two more CPAs were falling within the part of the current monitoring period. CAR 01 was raised in this respect. In response PP submitted revised	CAR 01	OK



gases achieved by the CPAs under the PoA and determined in the PoA-DD? In case of all CPA during the specified monitoring period is subject to verification and there is no provision in the registered PoA DD about verification on sampling basis, VT shall provide the affirmation in the answer of this checklist question. § 350 (a) of VVS (version 07.0).			MR in which CPA2 and CPA3 were also included. But as these two CPAs were not implemented till the end of this monitoring period, no emission reductions are claimed for these two CPAs. CAR was closed out.		
6.2 Have the DOE taken into account the possible existence of CPAs complying with different versions of the PoA ? If yes, has the DOE accounted for this in its sampling approach, to ensure that a statistically sound sample of CPAs from each version of the PoA are being verified? § 350 (b) of VVS (version 07.0).	/1/ /3/ /B04/	DR, I	Please refer to section 6.1 of the protocol above.	CAR-01	OK
6.3 Have the DOE made the single monitoring report for all CPAs of the PoA publicly available in accordance with the Project cycle procedure? § 350 (c) of VVS (version 07.0). Note: As per § 352 of VVS (version 07.0), <u>the request shall relate to all CPAs included in the PoA during the specified monitoring period</u> and as per § 298 of PS (version 07.0), the coordinating/managing entity shall: (a) Maintain all monitoring results of all CPAs in accordance with the record keeping system identified in the registered PoA-DD; (b) <u>Prepare a single monitoring report (i.e. one document) containing all monitoring results of all CPAs included in the PoA, clearly separating the monitoring results of individual CPAs, as well as grouping the monitoring results by CPA type defined by the relevant generic CPA-DD;</u> (c) Make available the monitoring report and all monitoring results requested by a DOE for verification purposes.	/1/ /3/ /B04/	DR, I	Please refer to section 6.1 of the protocol above.	CAR-01	OK



6.4 How the DOE systematically verified and certified the correct implementation and operation of the record-keeping system as stipulated in the registered PoA? § 350 (d) of VVS (version 07.0).	/1/ /3/ /B04/	DR, I	CAR 03, and CL 01 had been raised in this regard.	CAR 03 CL 01	OK
6.5 How the DOE applied the methods/procedures for the purpose of verification stipulated in the registered CDM-PoA-DD, in particular the site visits undertaken? § 351 of VVS (version 07.0).	/1/ /3/ /B04/	DR, I	During the site visit, verification team appointed by DOE visited the households to verify the installed cook stoves and all the monitoring system along with the monitoring database, data input equipment, and the raw data recorded.	OK	OK



List of findings (compliance of § 330 c and g of VVS)

Finding (reference section 1.1 of table 1)	CAR 01		
Classification	<input checked="" type="checkbox"/> CAR	<input type="checkbox"/> CL	<input type="checkbox"/> FAR
Description of finding (DOE)	Section A.1 or B.1 of MR doesn't provide any information on total number of stoves installed and operational under CPA0001 for this monitoring period. Also it is seen that only CPA0001 has been presented for verification although CPA0002 and CPA0003 are also covered during this monitoring period.		
Corrective Action or clarification #1 (PP shall write a detailed and clear corrective action or further information for clarification as per finding)	Section B.1 has been revised to include the number of stoves installed and in operation during the monitoring period.		
DOE Assessment #1 The assessment shall encompass all open issues in the finding. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.	Revised MR has been submitted stating the number of stoves installed in section B.1. However, as per the registered CPA DD, the number of cook stoves in the CPA 1 is 4,500. But as per the MR in this monitoring CME has distributed 9,446 stoves. PP needs to justify. PP needs to clarify non inclusion of CPA0002 and CPA0003 in this verification.		
Corrective Action or clarification #2 (PP shall write a detailed and clear corrective action or further information for clarification as per finding)	The 4,500 stoves as indicated in the registered CPA 1 were the estimated number of stoves that were envisioned to be distributed under the micro-scale CPA. However, since the average energy saving per stove is lower than initially expected at the CPA-DD, 9,446 stoves distributed could be included under CPA 1 without reaching the micro-scale threshold and therefore keeping the CPA still additional. The total energy saving of 42,676 MWh _{th} as indicated in the ER spreadsheet is below the microscale limit of 60GW _{th} for energy saving projects. Although CPA0002 and CPA0003 also falls under this monitoring period, but they were not included because these two CPAs are yet not implemented. However, they are being included in the MR now without claiming any emission reductions.		
DOE Assessment #2 The assessment shall encompass all open issues in the finding. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.	Although in the CPA-DD number of stoves was estimated as 4,500 and based on the estimated efficiencies, the CPA was estimated to be under the microscale limit. However, during the actual implementation of the CPA, numbers of stoves have been increased to 9,446 and the CPA still remains under the microscale limit. Hence the verification team deems it acceptable. However, PP is requested to provide further information on how the project implementation		



	<p>is in accordance with the description contained in the registered CPA-DD, considering that the efficiency of the ICSs has changed only 7%, while the number of distributed ICS has been doubled. (Please refer to VVS Ver. 7 paragraph 314)".</p> <p>CPA0002 has the monitoring period from 01/11/2013 to 14/12/2013 and CPA0003 from 01/12/2013 to 14/12/2013 falling in this monitoring period presented for verification. However, as these two CPAs have not been implemented till this monitoring period they could not be monitored. But they have been included in the revised MR now without claiming any emission reductions.</p> <p>The CAR is closed.</p>
<p>Corrective Action or clarification #3 (PP shall write a detailed and clear corrective action or further information for clarification as per finding)</p>	<p>The CPA-DD does not mention any limit or restriction on the number of stoves that can be implemented under the CPA. The following is mentioned in Section A.2, page 2 of the registered CPA-DD, version 3.2 dated 27/11/2012:</p> <p><i>"The CPA will have a maximum energy saving of less than or equal to 60 GWh_{th}/year, thus staying within the micro-scale threshold. Based on the estimated energy savings, it is envisaged that around 4,500 stoves will be distributed under the CPA. By the start of the CPA crediting period, which as indicated in Section A.4.3.1 is expected to be 15 December 2012, it is anticipated that all 4,500 of the ICS will be in operation."</i></p> <p>It is clearly stated in the CPA-DD that the ex-ante estimation of the number of cookstoves to be distributed under the CPA is only an indicative number based on the micro-scale annual energy saving threshold of 60GWh_{th}/year. It also assumes that 100% of distributed stoves remain operational ex-post. Both these parameters i.e. total number of stoves installed (N_{all}) and Stove Operation Fraction (SOF) are monitored parameters as per section B.6.1 of the registered CPA-DD and therefore subject to change based on ex-post monitoring activities. For example, the parameter values for 'efficiency of project stove (η_{new})' in the CPA-DD for the various stove models are the lab-tested design values of stove efficiency for ex-ante baseline emissions calculations only. The actual in-field operating efficiency deteriorates over time due to ageing of stove. Thus, the actual applicable values for ex-post ER calculations over a given monitoring period are determined via field-based monitoring activities.</p> <p>Furthermore, the average energy savings per stove during the monitoring period depends not just on the thermal efficiency of the stoves (η_{new}), but also on the other monitored parameters, including:</p> <ul style="list-style-type: none"> • "Stove Operation Fraction" (SOF);



	<ul style="list-style-type: none">• “the amount of woody biomass consumption that is consumed through the continued use of old stoves” (μ_{old});• “the fraction of end users that are still using baseline (replaced) stoves” (f_{old}); and,• “Calculated average stove operation years in the monitoring period” (Stove year). <p>The ex-post monitored values for these parameters were also found to be different from the ex-ante estimates provided in the registered CPA-DD. For instance, SOF was found to be 65.34% instead of the 95% anticipated in the CPA-DD. This is approximately 30% lower than initially assessed in section B.6.1 of the CPA-DD. Stove year was also estimated in the CPA-DD to be 1.00 while the monitored value is 0.87. The Stove year is lower due to the progressive distribution of cookstoves over the monitoring period. When considering the differences of the five parameter values together, not just the thermal efficiency, the average energy savings per stove is approximately 35.02% of what was initially estimated in the CPA-DD (refer CPA-DD section A.4.6). The 9,446 stoves included in the CPA results in 42.676 GWhth/year and therefore complies with the micro-scale threshold and the description contained in the CPA-DD, whereby “The CPA will have a maximum energy saving of less than or equal to 60 GWhth/year”.</p> <p>Thus, there are no design changes from the registered CPA.</p>								
DOE Assessment #3 <i>The assessment shall encompass all open issues in the finding. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	<p>Verification confirms that the cited difference in number of cook-stoves and efficiency falls under the purview of assessment of the project with the requirement contained in §273 c) of VVS Ver 07. The difference is due to the fact that the actual observed values of the monitored values are different from the ex-ante values. With the change in the values of parameter the total number of stoves has changed and still meets the micro-scale additionality requirements.</p> <p>The monitored (ex-post) parameters where there has been a change observed from the ex-ante values have been assessed below in accordance with §273 c) of VVS Ver 07:</p> <table><tr><th><u>Parameter</u></th><th><u>Ex-ante value in the CPA-DD</u></th><th><u>Actual operation for the reported monitoring period</u></th><th><u>Assessment by the verification team</u></th></tr><tr><td>Number of cook-stoves (N_{all})</td><td>4,500</td><td>9,375</td><td>Verification team noted that the actual number of cook-stoves</td></tr></table>	<u>Parameter</u>	<u>Ex-ante value in the CPA-DD</u>	<u>Actual operation for the reported monitoring period</u>	<u>Assessment by the verification team</u>	Number of cook-stoves (N_{all})	4,500	9,375	Verification team noted that the actual number of cook-stoves
<u>Parameter</u>	<u>Ex-ante value in the CPA-DD</u>	<u>Actual operation for the reported monitoring period</u>	<u>Assessment by the verification team</u>						
Number of cook-stoves (N_{all})	4,500	9,375	Verification team noted that the actual number of cook-stoves						



				<p><u>distributed under the CPA is higher than the number indicated in the registered CPA DD. This difference is acceptable based on the following:</u></p> <ul style="list-style-type: none"> → <u>CPA-DD does not restricts the number of cook stoves to 4,500 which is just an indicative value (as explained below)</u> → <u>The project energy saving is still less than 60 GWh_{th}/year.</u> → <u>The emission reductions from the project during the reported monitoring period are less than that estimated in the registered CPA DD for the same period.</u> <p><u>Verification team further noted that the cook-stove numbers as indicated in the registered CPA DD is not a fixed number (thus this cannot be categorized under a design change) and this assessment has been based on review of following paragraphs of CPA DD:</u></p> <p><u>"The CPA will have a maximum energy saving of less than or equal to 60 GWh_{th}/year, thus staying within the micro-scale threshold. Based on the estimated energy savings, it is envisaged that around 4,500</u></p>
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				<p><u>stoves will be distributed under the CPA.” (Refer Section A.2, of the registered CPA-DD, version 3.2 dated 27/11/2012).</u></p> <p><u>The number of cook-stoves stated in the CPA-DD is only an indicative number based on the micro-scale annual energy saving threshold of 60GWh_{th}/year. The 9,375 stoves implemented in the CPA results in 42.676 GWh_{th}/year of energy saving. The verification team noted that with the increase in number of stoves, the CPA still remains under the limit of micro scale and hence this is not deemed as any design change.</u></p> <p><u>Verification team during course of verification noted that the average energy savings per stove during the monitoring period depends not just on the thermal efficiency of the stoves (η_{new}), but also on the other monitored parameters, including:</u></p> <ul style="list-style-type: none"> <u>• “Stove Operation Fraction” (SOF);</u> <u>• “the amount of woody biomass consumption that is consumed through the continued use of old stoves” (μ_{old});</u> <u>• “the fraction of end users that</u>
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				<p>are still using baseline (replaced) stoves" (f_{old}); and,</p> <ul style="list-style-type: none"> • "Calculated average stove operation years in the monitoring period" (Stove year). <p>The ex-post monitored values for these parameters were also found to be different from the ex-ante estimates provided in the registered CPA-DD. For instance, SOF was found to be 65.34% instead of the 95% anticipated in the CPA-DD. This is approximately 30% lower than initially assessed in section B.6.1 of the CPA-DD. Stove year was also estimated in the CPA-DD to be 1.00 while the monitored valued is 0.87. The Stove year is lower due to the progressive distribution of cook-stoves over the monitoring period. When considering the differences of the aforesaid five parameter values together, (and not just the thermal efficiency), the average energy savings per stove is approximately 35.02% of what was initially estimated in the CPA-DD (refer CPA-DD section A.4.6) substantiating the increase in number of cook-stoves distributed under the CPA.</p>
	Efficiency of the ICS(n_{new})	36.3%	32.7%	The weighted average efficiency of the cook-stoves (n_{new})



				<p><u>monitored ex-post for the current monitoring period is less than the estimated ex-ante value in the CPA-DD. Verification team based on its sectoral expertise confirms that decrease in efficiency in actual project condition is a realistic condition and thus this issue does not require further assessment, as it does not lead to increase in emission reductions.</u></p> <p><u>This is also deemed acceptable to the verification team as the actual monitored efficiency is lower than the value indicated in the registered CPA DD and it does not lead to increase in emission reductions.</u></p>
	<u>Stove Operation Fraction (SOF)</u>	<u>0.95</u>	<u>0.6534</u>	<p><u>Since, the monitored ex-post value of SOF for the current monitoring period is less than the estimated ex-ante value in the CPA-DD, this is acceptable to the verification team, as it does not lead to increase of emission reductions.</u></p> <p><u>This is deemed acceptable.</u></p>
	<u>The amount of woody biomass consumption that is consumed through the continued use of</u>	<u>217.8 kg</u>	<u>2,657 kg</u>	<p><u>Since, the amount of woody biomass consumption that is consumed through the continued use of old stoves monitored ex-post for the current monitoring period is higher than the</u></p>



	<u>old stoves (μ_{old})</u>			<u>estimated ex-ante value in the CPA-DD, this is acceptable to the verification team as it does not lead to increase of emission reductions.</u> <u>This is deemed acceptable.</u>
	<u>The fraction of end users that are still using baseline (replaced) stoves (f_{old})</u>	<u>0.1</u>	<u>0.5362</u>	<u>Since, the fraction of end users that are still using baseline (replaced) stoves monitored ex-post for the current monitoring period is higher than the estimated ex-ante value in the CPA-DD, this is acceptable to the verification team as it does not lead to increase of emission reductions.</u> <u>This is deemed acceptable.</u>
	<u>Calculated average stove operation years in the monitoring period ($Stove_{year}$)</u>	<u>1</u>	<u>0.87</u>	<u>Stove_{year} monitored ex-post for the current monitoring period is lower than the estimated ex-ante value in the CPA-DD.</u> <u>This is deemed acceptable as it does not lead to increase of emission reductions.</u>
	<u>Verification team has assessed the project in order to check any proposed or actual changes to the project design in accordance with VVS Ver. 7 § 314. In the opinion of Carbon Check, there is no change to the project design. Paragraph 271 (a) of PS v7. is not applicable as there is no correction or changes to the project design. This conclusion has been arrived based on the assessment of the project inline with the requirements of § 270 (a) and § 271 of the VVS Version 07. Hence the CAR is closed.</u>			
Conclusion	<input type="checkbox"/> To be checked during the next periodic verification			



Tick the appropriate checkbox	<input type="checkbox"/> Outstanding finding (not closed) <input checked="" type="checkbox"/> The finding is closed
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Finding (reference section 1.5 of table 1)	CAR 02		
Classification	<input checked="" type="checkbox"/> CAR	<input type="checkbox"/> CL	<input type="checkbox"/> FAR
Description of finding (DOE)	Following sections of MR do not meet the "Instructions for filling out the monitoring report form (version 04.0)" in accordance with §261 of PS (version 07.0): 1. Section B.1 of the MR does not provide details of the installed technology, technical process and equipment involved, diagrams (where appropriate).		
Corrective Action or clarification #1 <i>(PP shall write a detailed and clear corrective action or further information for clarification as per finding)</i>	Further description of the installed technology, technical process and equipment involved has been added to section B.1.		
DOE Assessment #1 <i>The assessment shall encompass all open issues in the finding. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	Section B.1 of the revised MR provides the description of the installed technology along with diagram.		
Conclusion <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the next periodic verification <input type="checkbox"/> Outstanding finding (not closed) <input checked="" type="checkbox"/> The finding is closed		

Finding (reference section 1.5, 1.7, 3.6, 3.7, 3.8 and 6.4 of table 1)	CAR 03		
Classification	<input checked="" type="checkbox"/> CAR	<input type="checkbox"/> CL	<input type="checkbox"/> FAR
Description of finding (DOE)	In accordance with requirements stipulated under §250 of PS (Version 07.0), Section C of the MR doesn't provide information on organizational structure, roles and responsibilities of personnel, and emergency procedures for the monitoring system		
Corrective Action or clarification #1 <i>(PP shall write a detailed and clear corrective action or further information for clarification as per finding)</i>	Section C has been further explained to describe the organizational structure, roles and responsibilities of each party.		



Finding (reference section 1.5, 1.7, 3.6, 3.7, 3.8 and 6.4 of table 1)	CAR 03
DOE Assessment #1 <i>The assessment shall encompass all open issues in the finding. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	Section C of the revised MR submitted explains the organizational structure, roles and responsibilities of each party.
Conclusion <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the next periodic verification <input type="checkbox"/> Outstanding finding (not closed) <input checked="" type="checkbox"/> The finding is closed

Finding (reference section 3.1, 3.2, 3.2.1 and 3.2.2 of table 1)	CAR 04
Classification	<input checked="" type="checkbox"/> CAR <input type="checkbox"/> CL <input type="checkbox"/> FAR
Description of finding (DOE)	In section D.1 and D.2 of MR, for purpose of data it is stated, "Calculation of baseline emissions or baseline net GHG removals by sinks". PP shall explain how "baseline net GHG removals by sink" is applicable for this project activity.
Corrective Action or clarification #1 <i>(PP shall write a detailed and clear corrective action or further information for clarification as per finding)</i>	Following the attachment "Instructions for filling out the monitoring report form", the PP has described the purpose of data exactly as required in Section D, which states that one of the following three options must be chosen: a) "Calculation of baseline emissions or baseline net GHG removals by sink; b) Calculation of project emissions of actual net GHG removals by sink; c) Calculation of leakage" In this case, the PP has selected option a) and state it on the MR exactly as it comes in the Instructions, even if "baseline net GHG removals by sink" might be not applicable.
DOE Assessment #1 <i>The assessment shall encompass all open issues in the finding. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	Option a) states "Calculation of baseline emissions <u>or</u> baseline net GHG removals by sink". PP needs to justify the need of stating the second part of the statement when it is not applicable for this project activity.
Corrective Action or clarification #2 <i>(PP shall write a detailed and clear corrective action or further information for clarification as per finding)</i>	The second part of the statement 'baseline net GHG removal by sinks' has henceforth been removed.



Finding (reference section 3.1, 3.2, 3.2.1 and 3.2.2 of table 1)	CAR 04
DOE Assessment #2 <i>The assessment shall encompass all open issues in the finding. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	As the non applicable part (i.e. baseline net GHG removal by sinks') has been removed, the CAR is closed.
Conclusion <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the next periodic verification <input type="checkbox"/> Outstanding finding (not closed) <input checked="" type="checkbox"/> The finding is closed

Finding (reference section 3.9, 4.1.1, 4.1.2, 4.1.3, 4.1.4 and 4.1.5 of table 1)	CAR 05
Classification	<input checked="" type="checkbox"/> CAR <input type="checkbox"/> CL <input type="checkbox"/> FAR
Description of finding (DOE) 	<p>Section D.3 of the MR provides the total number of stoves distributed under the CPA0001 as 9,446. However, in section D.2 a value of 9,375 has been used for parameter N_{all} and for estimation of emission reduction. An additional comment has been provided which states, "For conservative purposes, 71 stoves from the initial 9,446 has been deleted after monitoring based on the information collected."</p> <p>PP shall explain the reason for using a value of 9,375 (i.e., discounting 71 stoves from the total of 9,446 stoves implemented under this CPA) for estimation of emission reduction and also for calculation of sample size for determining the value of following parameter:</p> <ul style="list-style-type: none"> • η_{new} • SOF • f_{old} • μ_{old}
Corrective Action or clarification #1 <i>(PP shall write a detailed and clear corrective action or further information for clarification as per finding)</i>	Initially, the CPA Distribution Record had 9,446 stoves distributed under the CPA. During monitoring, the information of 71 stoves could not be verified. Therefore, those 71 were considered as a Non Response for the survey records and for conservative purposes the stoves were excluded from the CPA so they do not credit for this or any future crediting periods. This is a conservative assumption since those stoves are likely to still be in operation.



DOE Assessment #1 <i>The assessment shall encompass all open issues in the finding. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	PP has not provided the explanation in the MR.
Corrective Action or clarification #2 <i>(PP shall write a detailed and clear corrective action or further information for clarification as per finding)</i>	The explanation given has been made available in the MR report in section D.2.
DOE Assessment #2 <i>The assessment shall encompass all open issues in the finding. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	The reason for exclusion of 71 stoves has been provided in the revised MR. Hence the CAR is closed.
Conclusion <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the next periodic verification <input type="checkbox"/> Outstanding finding (not closed) <input checked="" type="checkbox"/> The finding is closed

Finding (reference section 3.9, 4.1.1, 4.1.3, 4.1.4, 4.1.5 and 4.3 of table 1)	CAR 06		
Classification	<input checked="" type="checkbox"/> CAR	<input type="checkbox"/> CL	<input type="checkbox"/> FAR
Description of finding (DOE)	<p>PoA-DD and CPA-DD including CPA-1, state that a single sampling plan applying “Simple Random Sampling” covering a group of CPAs can be applied provided the homogeneity of population can be demonstrated, or differences are taken into account in the sample size calculation and 95/10 confidence/precision is applied.</p> <p>Furthermore, MR in section D.3 states, “<i>The Sample Method chosen was Simple Random Sampling for each of the parameters as defined by the CPA-DD. This method was proven to be appropriate since most of the distributed stoves were in the region of Kumasi, Ghana, where the DO has its operations</i>”.</p> <p>The CPA0001 consists of subpopulations which are different based on:</p> <ol style="list-style-type: none"> 1. Type of ICS (CH2200 and CH 2300) 2. Age of stoves ((it is understood that the monitoring plan covers the stoves that have been distributed in different years i.e. different vintages) 		



	<p>3. Thermal efficiency of stoves</p> <p>In the light of the above observation, PP shall explain how the sampling plan approach selected for this CPA complies with the methodology clarification SSC_695 which states that in general, while simple random sampling is suitable to apply to populations that are homogeneous, stratified random sampling is better suited for situations when the population is not homogeneous but instead consists of several subpopulations which are known to vary.</p>
<p>Corrective Action or clarification #1 <i>(PP shall write a detailed and clear corrective action or further information for clarification as per finding)</i></p>	<p>The sampling plan approach is based on the registered PoA-DD. A Simple Random Sampling was selected for a single Sampling Frame since the population is considered as homogeneous based on the PoA-DD provisions as follows:</p> <ul style="list-style-type: none"> - Country: all stoves where distributed under Ghana. - Fuel type: all stoves use charcoal as fuel. - End user: all stoves are for domestic (household) usage as per their design. - Stove type: the two stove models (CH2200 and CH2300) are considered sufficiently homogeneous since their thermal efficiencies are in a similar range as being with +/- 10% of each other, and they have common features. As for the efficiency, CH2200 has 33.06% and CH2300 32.57%. This is a difference of 0.49%, much below the required 10%. As for the common features, both stoves share the exact same structure and only differ in the grate, which is different so it can accommodate better different types of pots depending on the local preferences, but users of these stoves models share the same behaviour towards the use of the stoves. For these two reasons, it was understood both stoves models can be considered as for the same type. <p>As for the stove vintage, the registered monitoring plan in the PoA-DD and CPA-DD approved by the UNFCCC that was adopted for this verification does not consider a vintage based sampling approach and therefore it was not considered when designing the sampling frame. Clarification 695 does, however, refer to a PoA where vintage was considered as one of the main parameters to define the sampling frames, which is not our case.</p> <p>Since the whole stove population was considered as homogeneous, Simple Random Sampling was selected as appropriate.</p>
<p>DOE Assessment #1 <i>The assessment shall encompass all open issues in the</i></p>	<p>In Appendix 5 of the PoA DD it has been stated “<i>The CH2300 has an adapted design that is specifically suited to the round-bottomed stoves preferred by many local citizens.</i>”</p>



<p><i>finding. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i></p>	<p><i>Although the stove is otherwise the same as the CH2200 design, and has the same average thermal efficiency rating, a third sampling frame is pre-defined for sampling of this stove since it has slightly different features that could potentially influence end user behaviour (due to design preferences)."</i></p> <p>PP needs to explain the compliance of the above statement.</p>
<p>Corrective Action or clarification #2 <i>(PP shall write a detailed and clear corrective action or further information for clarification as per finding)</i></p>	<p>According to the registered PoA-DD, the sampling frames are defined based on 4 criteria: country, fuel type, end user and stove type. To the definition of stove types, the PoA-DD added a clarification on how to treat stoves that although they are not exactly the same model, their common features are such that they are in practice of the same type. This clarification treats stoves of different models as "similar" (of the same type) if they comply with: a) efficiencies are within a range of +/- 10% of each other, and b) they have common design features. The idea of this clarification on the stove type vs. stove model was meant exactly for cases like CH2200 and CH2300 where the stoves are within the range and have common design features even if they have been slightly modified to adapt to local circumstance all around the world. The difference between models is such that if the efficiency can hardly be affected and the main design features are the same, the models are of the same type for sampling purposes since it is expected that the other parameters will also remain constant.</p> <p>As pointed out, the PoA-DD had foreseen the possibility that a project developer might want the opposite and even if the models are the same type, they still want to consider them as different types in case the difference between models could potentially influence the end user behaviour. For this reason, the PoA-DD gave the option to treat them as different types by pre-defining another sampling frame for those project developers that would prefer this option. However, in the case of this CPA there were no evidences that the different feature between the two models had any influence on the end user and therefore considered as the same type.</p>
<p>DOE Assessment #2 <i>The assessment shall encompass all open issues in the finding. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i></p>	<p>Any sampling is based on some pre-defined assumptions/ criteria—pre sampling activity. In the present case-post sampling results (efficiency difference of 0.49% between CH 2200 and CH 2300) demonstrates the fact that PP's assumptions (in pre-sampling) is appropriate. Furthermore, as per the PoA DD, the sampling is to depend on the four factors which are: country, fuel type, end user and stove type. Country, fuel and end user are same. Only there are two different model of stoves which have a difference in efficiency of only 0.49%. As claimed by the PP, it was also confirmed during the on site visit that there is no</p>



	<p>influence on the end user for these two different models of stoves.</p> <p>Besides that verification team has independently checked /B09/ the technical specification of the CH 2200 and CH 2300 stove and found that these two stoves are same type of stoves with the only difference is the shape of the stove (CH 2300 has been designed for round-bottom pots).</p> <p>Hence the single sampling frame and simple random sampling is deemed acceptable. The CAR is closed.</p>
Conclusion <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the next periodic verification <input type="checkbox"/> Outstanding finding (not closed) <input checked="" type="checkbox"/> The finding is closed

Finding (reference section 3.9, 4.1.1, 4.1.3, 4.1.4, 4.1.5 and 5.1 of table 1)	CAR 07		
Classification	<input checked="" type="checkbox"/> CAR	<input type="checkbox"/> CL	<input type="checkbox"/> FAR
Description of finding (DOE)	<p>In the Emission Reduction spreadsheet (2014 08 14 EF GHN ER calculations CLEAN v01.xlsx) lot of the values in tab SOF, μ_{old}, f_{old}, Thermal Efficiency are hardcoded (i.e., without formula) and do not allow the user of the sheet or DOE to reproduce the exact results in a traceable and transparent manner.</p> <p>Furthermore, PP shall provide units against the parameters (e.g. μ_{old} in CPA1_final tab) in the ER sheet.</p>		
Corrective Action or clarification #1 <i>(PP shall write a detailed and clear corrective action or further information for clarification as per finding)</i>	<p>A new package of documentation including a new ER calculation spreadsheet, CPA monitoring records and CPA distribution records have been provided to the DOE which should allow to reproduce the calculations.</p> <p>Units have also been added in the ER sheet.</p>		
DOE Assessment #1 <i>The assessment shall encompass all open issues in the finding. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	<p>Many of the values are still hardcoded in the spread sheet and also the source of data has not been provided.</p> <p>Also some of the parameters (like "μ_{old}" vs "U_{old}"; "f_{old}" vs "F_{old}") are not consistent in between the ER sheet and the MR.</p>		
Corrective Action or clarification #2 <i>(PP shall write a detailed and clear corrective action or further</i>	<p>The hardcoded parameters come from another document. For those cases the source of the document has been provided. For instance, thermal efficiency or stove usage values</p>		



information for clarification as per finding)	come from the CPA monitoring records, provided to the DOE as file "5. CPA Monitoring Records_v02_CONFIDENTIAL.xls" The consistency of all parameters has also been checked and rectified.
DOE Assessment #2 <i>The assessment shall encompass all open issues in the finding. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	The spread sheet submitted provides references to all the values used in the ER calculation and / or formula are provided for clear understanding. Hence the CAR is closed.
Conclusion <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the next periodic verification <input type="checkbox"/> Outstanding finding (not closed) <input checked="" type="checkbox"/> The finding is closed

Finding (reference section 3.9, 4.1.1 and 5.1 of table 1)	CAR 08		
Classification	<input checked="" type="checkbox"/> CAR	<input type="checkbox"/> CL	<input type="checkbox"/> FAR
Description of finding (DOE)	In the "Thermal Efficiency" worksheet of Emission Reduction spreadsheet (2014 08 14 EF GHN ER calculations CLEAN v01.xlsx) the serial number (unique id) of the stoves used for determining the thermal efficiency are mentioned as "CONFIDENTIAL". PP shall explain the reason for not disclosing the serial number of stoves.		
Corrective Action or clarification #1 <i>(PP shall write a detailed and clear corrective action or further information for clarification as per finding)</i>	A revised version has been shared with the DOE with the serial number of the stoves under the thermal efficiency testing. The "Thermal Efficiency" results are part of the CPA Monitoring Records.		
DOE Assessment #1 <i>The assessment shall encompass all open issues in the finding. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	PP needs to provide reason for stating the file as confidential.		
Corrective Action or clarification #2 <i>(PP shall write a detailed and clear corrective action or further information for clarification as per finding)</i>	The file is confidential to the general public since it contains personal information of the stove users, including name, address, and telephone number as well as name and telephone number of alternative contacts. This information should not be disclosed to protect the privacy of the stove users. For publication in the UNFCCC website, the PP will provide an additional version of the documentation without sensitive information which should clearly allow to track the ER calculations without disclosing personal information of their users.		
DOE Assessment #2	PP has provided two versions of spread sheet. The one with detailed information of the end		



<i>The assessment shall encompass all open issues in the finding. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	user is to be treated as confidential. The CAR is closed.
Conclusion <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the next periodic verification <input type="checkbox"/> Outstanding finding (not closed) <input checked="" type="checkbox"/> The finding is closed

Finding (reference section 3.1, 3.2, 3.2.1 and 3.2.2 of table 1)	CAR 09		
Classification	<input checked="" type="checkbox"/> CAR	<input type="checkbox"/> CL	<input type="checkbox"/> FAR
Description of finding (DOE)	In section D.2 of MR, "Measuring/Reading/Recording frequency" for the following parameters is not consistent with that provided under section B.7.1 of approved revised PoA-DD (part II): 1. η_{new} 2. N_{all} 3. SOF 4. μ_{old} 5. f_{old} 6. Stove Years		
Corrective Action or clarification #1 <i>(PP shall write a detailed and clear corrective action or further information for clarification as per finding)</i>	The section D.2 of MR 'Measuring/Recording/Recording frequency has been revised in the MR to be consistent with section B.7.1 of the revised PoA-DD (part II) and the CPA-DD		
DOE Assessment #1 <i>The assessment shall encompass all open issues in the finding. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	The revised MR states the "Measuring/Reading/Recording frequency" in accordance with the revised approved PoA-DD.		
Conclusion <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the next periodic verification <input type="checkbox"/> Outstanding finding (not closed) <input checked="" type="checkbox"/> The finding is closed		

Finding (reference section 3.1, 3.2, 3.2.1 and 3.2.2 of table 1)	CAR 10		
Classification	<input checked="" type="checkbox"/> CAR	<input type="checkbox"/> CL	<input type="checkbox"/> FAR



Description of finding (DOE)	In section D.2 of MR, "QA/QC procedure" for the following parameters is not consistent with that provided under section B.7.1 of approved revised PoA-DD (part II): 1. η_{new}
Corrective Action or clarification #1 (PP shall write a detailed and clear corrective action or further information for clarification as per finding)	The section D.2 of MR, QA/QC procedure for the above parameter has been revised to be consistent with that of the PoA-DD.
DOE Assessment #1 The assessment shall encompass all open issues in the finding. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.	PP has submitted revised MR which states the QA/QC procedure of the parameter " η_{new} " in line with the revised approved PoA-DD.
Conclusion Tick the appropriate checkbox	<input type="checkbox"/> To be checked during the next periodic verification <input type="checkbox"/> Outstanding finding (not closed) <input checked="" type="checkbox"/> The finding is closed

Finding (reference section 3.1, 3.2, 3.2.1 and 3.2.2 of table 1)	CAR 11		
Classification	<input checked="" type="checkbox"/> CAR	<input type="checkbox"/> CL	<input type="checkbox"/> FAR
Description of finding (DOE)	In section D.2 of MR, "Purpose of data" for the following parameters is not consistent with that provided under section B.7.1 of approved revised PoA-DD (part II): 1. η_{new} 2. N_{all} 3. SOF 4. μ_{old} 5. f_{old} 6. Stove Years		
Corrective Action or clarification #1 (PP shall write a detailed and clear corrective action or further information for clarification as per finding)	As explained in CA04, Purpose of data is consistent with the "Instructions for filling out the monitoring report form".		
DOE Assessment #1 The assessment shall encompass all open issues in the finding. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.	Option a) states "Calculation of baseline emissions <u>or</u> baseline net GHG removals by sink". PP needs to justify the need of stating the second part of the statement when it is not applicable for this project activity.		
Corrective Action or clarification #2	The second part of the statement has been removed from the MR henceforth as it is not		



<i>(PP shall write a detailed and clear corrective action or further information for clarification as per finding)</i>	applicable to the project activity.
DOE Assessment #2 <i>The assessment shall encompass all open issues in the finding. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	As the non applicable part (i.e. <i>baseline net GHG removals by sink</i>) has been removed, the CAR is closed.
Conclusion <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the next periodic verification <input type="checkbox"/> Outstanding finding (not closed) <input checked="" type="checkbox"/> The finding is closed

Finding (reference section 3.9, 4.1.4 and 5.1 of table 1)	CAR 12		
Classification	<input checked="" type="checkbox"/> CAR	<input type="checkbox"/> CL	<input type="checkbox"/> FAR
Description of finding (DOE)	<p>For parameter μ_{old} a value of 2.66 kg/yr is stated in section D.2 of MR and worksheet μ_{old} of ER sheet. However a value of 2.66 t/yr has been provided in section D.3 of MR. Furthermore, in worksheet CPA1_final of ER sheet a value of 2657 has been used for the same parameter.</p> <p>PP shall clearly specify the correct value of the parameter along with correct SI units consistently throughout the MR and ER sheet.</p>		
Corrective Action or clarification #1 <i>(PP shall write a detailed and clear corrective action or further information for clarification as per finding)</i>	Monitoring Report and ER calculations has been revised as necessary to reflect 2,657 kg/year in line with the CPA-DD.		
DOE Assessment #1 <i>The assessment shall encompass all open issues in the finding. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	Revised MR still states 2,657 t/year.		
Corrective Action or clarification #2 <i>(PP shall write a detailed and clear corrective action or further information for clarification as per finding)</i>	The SI unit has been corrected in the MR and the ER spreadsheet accordingly.		
DOE Assessment #2 <i>The assessment shall encompass all open issues in the</i>	MR has been revised with correct value as 2,657 kg/year. Hence the CAR is closed.		



finding. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.	
Conclusion <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the next periodic verification <input type="checkbox"/> Outstanding finding (not closed) <input checked="" type="checkbox"/> The finding is closed

Finding (reference section 1.5 of table 1)	CAR 13		
Classification	<input checked="" type="checkbox"/> CAR	<input type="checkbox"/> CL	<input type="checkbox"/> FAR
Description of finding (DOE)	Host Party(ies) indicated on the cover page and in section A.2 and A.3 of MR are not consistent with the information on host party(ies) provided on UNFCCC website and in approved revised PoA-DD (version 4.3, dated 07/06/2014)		
Corrective Action or clarification #1 <i>(PP shall write a detailed and clear corrective action or further information for clarification as per finding)</i>	Above mentioned sections in the MR have been revised to reflect the three host countries of the PoA, Ghana, Nigeria and Liberia. Only Ghana is host party for the CPA monitored (CPA00001) under this monitoring period.		
DOE Assessment #1 <i>The assessment shall encompass all open issues in the finding. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	MR has been revised stating the host parties in accordance with the project page on UNFCCC web site.		
Conclusion <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the next periodic verification <input type="checkbox"/> Outstanding finding (not closed) <input checked="" type="checkbox"/> The finding is closed		

Finding (reference section 4.1.1, 4.1.2, 4.1.3, 4.1.4, 4.1.5, 4.1.6 and 6.4 of table 1)	CL 01		
Classification	<input type="checkbox"/> CAR	<input checked="" type="checkbox"/> CL	<input type="checkbox"/> FAR



Finding (reference section 4.1.1, 4.1.2, 4.1.3, 4.1.4, 4.1.5, 4.1.6 and 6.4 of table 1)	CL 01
Description of finding (DOE)	PP shall provide the following supporting/reference documents: <ol style="list-style-type: none"> 1. WBT records 2. CPA distribution records 3. End user behaviour survey records 4. CPA monitoring record. 5. Evidence for carbon credit waiver by end user 6. Training records of the individuals who carried out sampling of stoves
Corrective Action or clarification #1 (PP shall write a detailed and clear corrective action or further information for clarification as per finding)	The following documentation has been provided: <ol style="list-style-type: none"> 1. WBT records for tested stoves. 2. CPA distribution records 3. End user behaviour survey records as part of the CPA monitoring record 5. CPA monitoring record 6. Carbon credit waiver evidence by the end user 7. Training presentation on how to fill in the survey records.
DOE Assessment #1 The assessment shall encompass all open issues in the finding. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.	"End user behaviour survey records as part of the CPA monitoring record" could not be found.
Corrective Action or clarification #2 (PP shall write a detailed and clear corrective action or further information for clarification as per finding)	Those can be found in the shared file "5. CPA Monitoring Records_v02_CONFIDENTIAL.xls", sheet "Surveys".
DOE Assessment #2 The assessment shall encompass all open issues in the finding. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.	PP has provided the required spread sheet for end user behaviour. The CL is closed.
Conclusion Tick the appropriate checkbox	<input type="checkbox"/> To be checked during the next periodic verification <input type="checkbox"/> Outstanding finding (not closed) <input checked="" type="checkbox"/> The finding is closed

Finding (reference section 1.6, 3.9, 5.1 of table 1)	CL 02
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Finding (reference section 1.6, 3.9, 5.1 of table 1)	CL 02		
Classification	<input type="checkbox"/> CAR	<input checked="" type="checkbox"/> CL	<input type="checkbox"/> FAR
Description of finding (DOE)	In section E.7 and on the cover page of MR, a value of 459 tCO ₂ eq has been provided for actual GHG emission reductions achieved during the period up to 31 December 2012. However, the calculation of same is not provided in Emission Reduction spreadsheet (2014 08 14 EF GHN ER calculations CLEAN v01.xlsx) and hence, it is not clear how PP arrived at this value.		
Corrective Action or clarification #1 <i>(PP shall write a detailed and clear corrective action or further information for clarification as per finding)</i>	Calculations have been revised to 458 tCO ₂ eq for up to 31/12/2012 and to 12,014 tCO ₂ eq from 01/01/2013 onwards. Calculations are also clearly described in the revised ER spreadsheet version 1.3		
DOE Assessment #1 <i>The assessment shall encompass all open issues in the finding. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	The revised spread sheet submitted shows the calculation for 2012 and post 2012 separately. Hence the CL is closed.		
Conclusion <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the next periodic verification <input type="checkbox"/> Outstanding finding (not closed) <input checked="" type="checkbox"/> The finding is closed		



Field Code Changed

APPENDIX D

Certificates of Competence



Carbon Check (India) Private Ltd.

Anubhav Dimri

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

For following functions:

Validator ☒ Team Leader ☒ Technical reviewer ☒
Verifier ☒ Technical Expert ☒ Local Assessor¹ ☒

In the following Technical Areas:

TA 1.1 ☒ TA 3.1 ☒ TA 5.2 ☐ TA 9.2 ☐ TA 13.2 ☐
TA 1.2 ☒ TA 4.1 ☐ TA 8.1 ☐ TA 10.1 ☐ TA 14.1 ☐
TA 2.1 ☐ TA 5.1 ☐ TA 9.1 ☐ TA 13.1 ☒

Mr. Vikash Kumar Singh
Director

Mr. Amit Anand
Director



Date of Approval
26/12/2014

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25/12/2015

Revision History of the Document

26/12/2014

Initial Adoption

¹India, South Africa

CARBON CHECK (INDIA) PRIVATE LIMITED

Registered in India: U74930DL2012PTC232495

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

Corporate off: 209, 2nd Floor, Vishwadeep Tower, District Centre, Janak Puri, New Delhi - 110058

Tel: +91 11 41042399 | URL: www.carboncheck.co.in | e-mail: info@carboncheck.co.in



Carbon Check (India) Private Ltd.

Sanjay Agarwalla

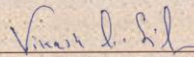
has been qualified as per CCIPL's internal qualification procedures, in accordance with requirements of Accreditation Standard (version 06.0):

For following functions:

Validator ☒ Team Leader ☒ Technical reviewer ☒
Verifier ☒ Technical Expert ☒ Local Assessor¹ ☒

In the following Technical Areas:

TA 1.1 ☒ TA 3.1 ☒ TA 5.2 ☒ TA 9.2 ☒ TA 13.2 ☐
TA 1.2 ☒ TA 4.1 ☒ TA 8.1 ☐ TA 10.1 ☐ TA 14.1 ☐
TA 2.1 ☒ TA 5.1 ☒ TA 9.1 ☒ TA 13.1 ☒


Mr. Vikash Kumar Singh

Director


Mr. AmitAnand

Director



Date of Approval
26/12/2014

Valid Till
25/12/2015

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Vikash Kumar Singh


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
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Mr. Anubhav Dimri
Director


Mr. AmitAnand
Director



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