Gold Standard

Verification Report

"Improved Cookstoves for Social Impact in Ugandan Communities"

GS Project No. GS447
Crediting Period 2 (MP01)

Monitoring Period: 01/04/2014 – 30/06/2015

For
Impact Carbon

Report Ref No. GS.VER.15.30 (CP2. MP01)

Executive Summary:

A) Basic information			
Project title	Improved Cookstoves for Social Impact in Ugandan Communities		
GS registration number	GS447		
UNFCCC ref number	N/A		
Date of registration	26/03/2009		
Sectoral scope	3: Energy Demand		
Methodology/ies applied	Technologies and Practices to Displace Decentralized Thermal Energy Consumption – 11/04/2011		
Project participant	Impact Carbon		
B) Verification			
Start date of crediting period	01/04/2014 (2nd crediting period)		
Monitoring Period	01/04/2014 – 30/06/2015		
Emission Reductions verified	**980,920 tCO_2e**		
C) Monitoring report	**Version**	**Date**	
Submitted to Earthood	1.0	29/07/2015	
Final	3	31/03/2016	
D) Verification report	**Version**	**Date**	
Draft	1.0	02/03/2016	
Final	2	01/04/2016	
E) Verification Team			
Team Leader	Shreya Garg		
Verifier & Local expert	Shreya Garg		
Technical Expert (TA 3.1)	Ashok Kumar Gautam		
F) Approvals			
Technical Reviewer	Kaviraj Singh	**Date**	04/04/2016
Technical Expert (TA 3.1)	Nayan Jyoti Deka		
G) Final opinion			
Earthood has performed the verification of the GS Project "Improved Cookstoves for Social Impact in Ugandan Communities" GS Ref. Number GS447. The verification includes confirming the implementation of the monitoring plan of the registered PDD dated 03/03/2014 (for the second crediting period) and the application of the monitoring methodology 'Technologies and Practices to Displace Decentralized Thermal Energy Consumption" – 11/04/2011'. Earthood confirms that the monitoring system is in place and the emission reductions are calculated without material misstatements. The emission reductions from the above referred GS project activity during the period 01/04/2014 – 30/06/2015 (including both days) amount to **980,920** tonnes of CO_2e.			
H) Authorization			
Quality Manager	Abhishek Mahawar		
Date	04/04/2016		
I) Distribution			
No public distribution without written confirmation from client.			

Abbreviations

CAR	Corrective Action Request
CDM	Clean Development Mechanism
CER	Certified Emission Reduction
CL	Clarification Request
DOE	Designated Operational Entity
DNA	Designated National Authority
EB	Executive Board
FAR	Forward Action Request
FT	Field Test
GHG	Greenhouse Gas(es)
GS	Gold Standard
HH	Household
IPCC	Intergovernmental Panel on Climate Change
KPT	Kitchen Performance Test
PDD	Project Design Document
RMP	Revised Monitoring Plan
UNFCCC	United Nations Framework Convention on Climate Change

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1. INTRODUCTION

1.1 Objective

Impact Carbon has contracted Earthood Services Private Limited (Earthood) to conduct the verification and certification of emission reductions reported for the GS Project GS GS447 “Improved Cookstoves for Social Impact in Ugandan Communities” for the monitoring period 01/04/2014 – 30/06/2015. This report contains the findings of the verification process and a certification statement for the certified emission reductions.

The verification is the periodic independent review and *ex post* determination by Earthood of the monitored reductions in GHG emissions that have occurred as a result of the registered GS Project activity during a defined monitoring period. Certification is the written assurance by Earthood 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 project activity “Improved Cookstoves for Social Impact in Ugandan Communities” for the period 01/04/2014 – 30/06/2015.

1.2 Scope

The scope of the verification is to establish and verify that;

a) The project activity has been implemented and operated as per the registered PD, revised PD and all physical features (technology, project equipment, and monitoring and metering equipment) of the project are in place.

b) The monitoring report and other supporting documents provided are complete in accordance with the latest applicable version of the completeness checklist for requests for issuance of VERs, verifiable, and in accordance with applicable GS requirements.

c) The actual monitoring systems and procedures comply with the monitoring systems and procedures described in the monitoring plan, any revised approved monitoring plan, the approved methodology including applicable tool(s) and/or, where applicable, the approved standardized baseline;

d) The data recorded and stored as per the monitoring methodology including applicable tool(s).

The verification report includes the following;

a) Emission reduction

b) Leakages

c) Changes to the key sustainable development indicators

d) Achievement and implementation of mitigation/compensation measures, according to the success indicators established in the monitoring plan of registered PDD and passport

e) Response by project participants to the grievances raised by local stakeholders

2. METHODOLOGY

2.1 Desk Review

The verification is performed primarily as a desk review of the documents submitted at various stages of assessments. The review is performed by assessment team using dedicated protocols/checklists. The assessment team cross checks the information provided in the documents (PDD, MR) and

information from sources other than those used, if available, and also conducts independent background investigations. Earthood conducted a desk review as under;

a) A review of the data and information presented to verify their completeness;
b) A review of the monitoring plan, the monitoring methodology including applicable tool(s) and, where applicable, the applied standardized baseline, paying particular attention to the frequency of measurements, the quality of metering equipment including calibration requirements, and the quality assurance and quality control procedures;
c) An evaluation of data management and the quality assurance and quality control system in the context of their influence on the generation and reporting of emission reductions;

The complete list of documents reviewed is included under Section 5.

2.2 Site Visits

The assessment involved a desk review of relevant documentation as well as an on-site visit(s). The site visit for the project location, by the assessment team, was conducted from 18/08/2015 to 20/08/2015. The role of each member of assessment team is mentioned below and their CVs are included in Section 7 of the report. 50 households were checked by the verification team through site visits. The households comprised of stoves built since 2006 in order to confirm representativeness of the sample. The samples confirmed reported figures /9/. The details of the activities conducted on site visit are given in various section of this report.

Table 1: Details of assessment team

Role	Name	Nature of involvement					
		Desk Review	On Site Visit	Reporting	Supervision	Technical Review	TA Expert
Team Leader & Local Expert	Shreya Garg	Y	Y	Y	Y		-
Technical Expert	Ashok Kumar Gautam	Y	N	Y	N		Y
Technical Reviewer (TR)	Abhishek Mahawar					Y	N
Technical Expert at TR	Ashu Sharma					N	Y

Table 2: List of the person interviewed on site

S.No	Name	Affiliation	Topic of discussion
1	Sandeep Melana	Impact Carbon	Gold Standard procedures
2	Brendan Sullivan	Impact Carbon	Management and operation of the project
3	Kirabo Noah	Impact Carbon	Training etc.
4.	Akankunda Moreen	Impact Carbon	Baseline, project monitoring, Sampling

2.3 Reporting of Findings

The objective of this step is to identify, discuss and conclude on the issues related to the monitoring, implementation and operations of the registered project activity that could impair the capacity of the registered project activity to achieve emission reductions or influence the monitoring and reporting of emission reductions. This is done based on the desk review and onsite assessment. The verification team prepares and/or updates a verification protocol (internal document) that records the conformities and nonconformities, which may be of following types;

CAR (Corrective Action Request) is raised if one of the following occurs:

a) Non-compliance with the monitoring plan, the methodology or the standardized baseline 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
b) Modifications to the implementation, operation and monitoring of the registered project activity has not been sufficiently documented by the project participants
c) Mistakes have been made in applying assumptions, data or calculations of emission reductions that will impact the quantity of emission reductions
d) Change to the key sustainable development indicators
e) Issues identified in a FAR during validation to be verified during verification or previous verification(s) have not been resolved by the project participants.

Clarification request (CL) is raised if information is insufficient or not clear enough to determine whether the applicable GS requirements have been met. All CARs and CLs raised by the Earthood during verification shall be resolved prior to submitting a request for issuance.

FAR (Forward Action Request) is raised during verification if the monitoring and reporting require attention and/or adjustment for the next verification period.

All the findings that are raised and communicated to project participant during the verification are included under Section 6. The section also includes the response, if provided, by the project participants and an assessment by the verification team if it was closed out or otherwise.

2.4 Quality Control & Technical Review

A draft verification report that is prepared by assessment team will be reviewed by an independent technical review team (one or more members) to confirm if the internal procedures established and implemented by Earthood were duly complied with and such opinion/conclusion is reached in an objective manner that complies with the applicable Gold Standard and CDM requirements. The technical review team is collectively required to possess the technical expertise of all the technical area/sectoral scope the project activity relates to. All team members of technical review team are independent of the verification team. The report approved by Quality Manager is endorsed by Managing Director, who is overall responsible to ensure quality, before final release. The further details of applicable procedures and responsibilities about Earthood Quality Management System (QMS) are available on its website (www.earthood.in).

3. VERIFICATION FINDINGS

This section summarises the findings of the verification.

3.1 Remaining Issues (FAR(s) from validation or previous verification)

There was one FAR raised during the crediting period renewal of the project activity; the analysis of the FAR is as follows; “The Project boundary is being extended to the whole country, which includes rural and urban HHs of Uganda. The current baseline survey clearly indicates the fuel choices, however does not provide much information on the fuel consumption level in rural and urban HHs. Therefore, it is difficult to conclude that along with other similarities like cooking frequency, meal preference the level

of fuel consumption will be similar for rural and urban population. It is recommended that the PP shall design the KPT sample size with fair representation of both rural and urban population to assess if there is a need of further division of project scenarios based on fuel consumption level."
Based on the above query from GS the PP conducted the KPT survey/12/ to include both rural and urban population. A total of 107 sample survey were conducted which included 59 rural households and remaining 48 urban households. The survey results were further analysed for computing the fuel consumption level; for rural HH is 0.116 Kg/person-meal and urban HH is 0.100 Kg/person-meal. Evident from the analysis the difference is less than 10%, also the cooking practices are similar throughout the country. Therefore, the assessment team is of the opinion that a further division of the project scenarios is not required and the current practise is representative of the entire country The FAR is therefore adequately attended and therefore closed.
One FAR had been raised during the previous verification which is as follows: "The PP shall revise the monitoring plan for Air Quality indicator to include questions to explore the effects of carbon monoxide exposure on the kitchen survey." The PP revised their Kitchen Survey forms to include more questions on incidences such as headache, weakness, vomiting, dizziness, difficulty breathing and nausea. The revised survey form samples were submitted to the assessment team based on which it can be concluded that the monitoring of effects of carbon monoxide exposure in the households has reduced. It can be concluded that the revised survey sheets include appropriate provisions to include the information regarding carbon monoxide impact monitoring. The FAR is therefore closed.

3.2 Project implementation

The project has been implemented in accordance with the registered Gold Standard Project titled 'Improved Cookstoves for Social Impact in Ugandan Communities'. Project Design Document is registered against methodology "Technologies and Practices to Displace Decentralized Thermal Energy Consumption – 11/04/2011".

Through the implementation of this project, the improved cook stove replaces the traditional stove thereby contributing to a reduction in carbon emissions and improvement of environmental conditions of the local community as outlined in the registered design documents.

The design specifications of the cook-stoves/10,12/ distributed under the project were checked by the verification team and found to be conforming to the information provided in the GS-registered design documents including the revised documentation at the time of renewal of crediting period. The implementation schedule has been adequately covered in the MR and was duly verified during the on-site assessment.

QA/QC procedures, as detailed in the registered Project Design Document have been followed during the implementation of the project. However, the discrepancies in the monitoring of parameters and monitoring approach in the monitoring report that are not consistent with the registered PDD in terms of unit and measurement procedures are discussed in the findings. The data/parameters that are monitored for the calculation of emission reductions are also discussed in the following sections.

3.3 Project Design Change (non-material), if any

There are a few inclusions in the monitoring report to which are as follows:

a) The monitored parameter
    a. Average number of person meal in a single household in one day
    b. Household who are using more than 1 project stoves

The two parameter had been monitoring from the time of project registration and invariably got missed out in the monitoring plan in the revised PDD/1/ at the time of project renewal. The parameters add transparency in the data flow and therefore their inclusion has been found acceptable.

b) Ex-ante parameters: the NCV, CO_2 emission factor, Non- CO_2 emission factor and emission factor from fuel production have been included for charcoal. Based on the field studies and onsite

observations charcoal is the fuel used by majority of the households. Therefore for the calculation of emission reductions the values for charcoal were required to be included. The values included have been accepted by the assessment team as they have been sourced from the IPCC default/19/ values subscribed by the applied methodology. The values are:

Parameter	Value
NCV of Fuel that has been substituted	29.5 TJ/Gg
CO_2 Emission Factor (Fuel Consumption)	112,000 kgCO_2 / TJ
Non-CO_2 Emission Factor	9.886 kgCO_2 / TJ
Emission Factor from Fuel Production	1.802 kgCO_2 / kg of charcoal production

It is worthy to note that the project activity underwent renewal in crediting period and the revised PDD/1/ missed these parameters. The parameters were being used for emission reduction calculation during the crediting period.

3.4 Verification of monitoring parameters (Carbon)

The sections below describe how each parameter, which is measured according to the monitoring plan, has been verified to confirm that the actual monitoring complies with the monitoring plan, monitoring data has thoroughly been assessed and that the calibration requirements are met.

3.4.1 Quantity of fuel (Charcoal) that is consumed in baseline scenario b during year y; $P_{b,y}$; Kg/person-meal

Criteria/Requirements	Assessment/Observation
Measuring /Reading /Recording frequency	Biennial surveys were conducted /11-15/
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology?	The monitoring frequency is in line to the monitoring plan and monitoring methodology
Monitoring equipment	Manual surveys so no monitoring equipment in use /9/
Is accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer's specification?	N/A
Is the accuracy valid for the entire measuring range or do different accuracy levels apply to different measuring ranges?	N/A
Calibration frequency /interval:	N/A

Is the calibration interval in line with the monitoring plan and/or methodology? If the monitoring plan does not specify the frequency of calibration, is the selected frequency in accordance with the local/national standards, or as per the manufacturer's specifications?	N/A
Is the calibration of measuring equipment carried out by an accredited person or institution?	N/A
Is (are) calibration(s) valid for the whole reporting period?	N/A
Is the calibration carried out for a measuring range comparable with the range for which measurements have been carried out?	N/A
How were the values in the monitoring report verified?	A copy of the survey/10/ conducted in January 2016 was verified, also the value was compared from the previous verification documents from crediting period 1/2/. The quantity of the fuel consumed in the baseline scenario is 0.204 kg/person-meal
If applicable, has the reported data been cross-checked with other available data?	The survey is conducted by trained staff by Impact Carbon. The staff trained for conducting the survey was interviewed during the onsite assessment. The team is of the opinion that the baseline survey has been conducted keeping in mind the requirement of the methodology. The value was found acceptable in view of the technical expert as the value is comparable to the fuel consumed in the previous verifications/2/.
Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes. The raw data was also made available along with the compiled excel sheet; the verification team conducted random check to verify the information flow. The values in the KPT Baseline stoves/12/ excel sheet could be confirmed from the source forms filled by the Impact Carbon staff during surveys/10/.

3.4.2 Quantity of fuel that is consumed in project scenario b during year y; $P_{p,y}$; Kg/person-meal

Criteria/Requirements	Assessment/Observation
Measuring /Reading /Recording frequency	Biennial surveys were conducted /11-15/

Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology?	The monitoring frequency is in line to the monitoring plan and monitoring methodology
Monitoring equipment	Manual surveys so no monitoring equipment in use /9/
Is accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer's specification?	N/A
Is the accuracy valid for the entire measuring range or do different accuracy levels apply to different measuring ranges?	N/A
Calibration frequency /interval:	N/A
Is the calibration interval in line with the monitoring plan and/or methodology? If the monitoring plan does not specify the frequency of calibration, is the selected frequency in accordance with the local/national standards, or as per the manufacturer's specifications?	N/A
Is the calibration of measuring equipment carried out by an accredited person or institution?	N/A
Is (are) calibration(s) valid for the whole reporting period?	N/A
Is the calibration carried out for a measuring range comparable with the range for which measurements have been carried out?	N/A
How were the values in the monitoring report verified?	A copy of the survey conducted in June July 2015 was verified, also the value was compared from the previous verification documents from crediting period 1/2/. The quantity of the fuel consumed in the baseline scenario is 0.108 kg/person-meal
If applicable, has the reported data been cross-checked with other available data?	The field surveys are conducted by trained staff by Impact Carbon. The staff trained for conducting the survey was interviewed during the onsite assessment. The team is of the opinion that the kitchen survey has been conducted keeping in mind the requirement of the methodology.

	The value was found acceptable in view of the technical expert as the value is comparable to the fuel consumed in regions under similar conditions/10,11/
Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, The raw data was also made available along with the compiled excel sheet; the verification team conducted random check to verify the information flow. The values in the excel sheet could be confirmed from the source forms filled by the Impact Carbon staff during surveys/14/.

3.4.3 Cumulative Usage rate for technologies in project scenario p in year y, based on cumulative adoption rate and drop off rate revealed by the usage surveys.; $U_{b,y}$

Criteria/Requirements	Assessment/Observation
Measuring /Reading /Recording frequency	Surveys are conducted on a sample group sizing 100 with at least 30 households for each age category of stove by year. 330 household surveys were conducted by Impact Carbon trained staff in June 2015 (complying to annual frequency) hence are applicable for the concerned monitoring period/14/. The data sheet provided by the PP was checked by Earthood team from the source survey forms. 50 households were checked by the verification team through site visits. The households comprised of stoves built since 2006 in order to confirm representativeness of the sample. The samples confirmed reported figures /9/.
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology?	Yes
Monitoring equipment	N/A
Is accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer's specification?	N/A
Is the accuracy valid for the entire measuring range or do different accuracy levels apply to different measuring ranges?	N/A
Calibration frequency /interval:	N/A

<table>
<tr><td>Is the calibration interval in line with the monitoring plan and/or methodology? If the monitoring plan does not specify the frequency of calibration, is the selected frequency in accordance with the local/national standards, or as per the manufacturer's specifications?</td><td>N/A</td></tr>
<tr><td>Is the calibration of measuring equipment carried out by an accredited person or institution?</td><td>N/A</td></tr>
<tr><td>Is (are) calibration(s) valid for the whole reporting period?</td><td>N/A</td></tr>
<tr><td>Is the calibration carried out for a measuring range comparable with the range for which measurements have been carried out?</td><td>N/A</td></tr>
<tr><td>How were the values in the monitoring report verified?</td><td>Usage figures were updated to reflect complete and accurate calculations. The values listed in the Usage survey analysis are verified from the Usage Monitoring report/10/, (Charcoal) as follows:
<table>
<tr><th>Stove Age Group</th><th>Usage Rate</th></tr>
<tr><td>0, 1</td><td>98%</td></tr>
<tr><td>1, 2</td><td>89%</td></tr>
<tr><td>2, 3</td><td>83%</td></tr>
<tr><td>3, 4</td><td>81%</td></tr>
<tr><td>4, 5</td><td>88%</td></tr>
<tr><td>5, 6</td><td>69%</td></tr>
<tr><td>6, 7</td><td>63%</td></tr>
<tr><td>7, 8</td><td>27%</td></tr>
<tr><td>8, 9</td><td>13%</td></tr>
</table>
The reported values are found okay during onsite visits and desk review /9/</td></tr>
<tr><td>If applicable, has the reported data been cross-checked with other available data?</td><td>Randomly selected households were visited to cross check the information available on database /9/</td></tr>
<tr><td>Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?</td><td>Usage surveys conducted by the Impact Carbon team were verified from the source survey forms/14/ and found acceptable. /9/</td></tr>
</table>

3.4.4 Technologies in the project database for project scenario p through monitoring period; $N_{p,y}$

Criteria/Requirements	Assessment/Observation
Measuring /Reading /Recording frequency	Continuous monitoring

Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology?	The stove sales record is maintained in a sales database includes the date of installation, beneficiary name, ID number, location, type of stove for all the households that receive a stove. The measuring and recording frequency of this parameter was found in line to the monitoring plan and methodology requirements /16/
Monitoring equipment	None required for monitoring.
Is accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer's specification?	Not applicable
Is the accuracy valid for the entire measuring range or do different accuracy levels apply to different measuring ranges?	N/A
Calibration frequency /interval:	N/A
Is the calibration interval in line with the monitoring plan and/or methodology? If the monitoring plan does not specify the frequency of calibration, is the selected frequency in accordance with the local/national standards, or as per the manufacturer's specifications?	N/A
Is the calibration of measuring equipment carried out by an accredited person or institution?	N/A
Is (are) calibration(s) valid for the whole reporting period?	N/A
Is the calibration carried out for a measuring range comparable with the range for which measurements have been carried out?	N/A
How were the values in the monitoring report verified?	The verification team aaccessed the sales database on computers and random sampling checks done on site with the records and found satisfactory/9/.
If applicable, has the reported data been cross-checked with other available data?	Yes, the reported data in the MR was cross checked by doing on-site surveys /9/

Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, The central sales database is maintained by Impact Carbon management, and quality checks are made for avoiding the possibilities of errors /9/

3.4.5 Leakage in project scenario p during year y

No leakage source was identified during the project monitoring; details have been included in the forth-coming sections.

3.4.6 Average number of person meal in a single household in one day; Person-meals/HH-day

Criteria/Requirements	Assessment/Observation
Measuring /Reading /Recording frequency	Biennial surveys were conducted in July 2015 for the current monitoring period/11-15/
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology?	The parameter has been included during this verification.
Monitoring equipment	Manual surveys are conducted and hence no monitoring equipment are used /9/
Is accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer's specification?	N/A
Is the accuracy valid for the entire measuring range or do different accuracy levels apply to different measuring ranges?	N/A
Calibration frequency /interval:	N/A
Is the calibration interval in line with the monitoring plan and/or methodology? If the monitoring plan does not specify the frequency of calibration, is the selected frequency in accordance with the local/national standards, or as per the manufacturer's specifications?	N/A
Is the calibration of measuring equipment carried out by an accredited person or institution?	N/A

Is (are) calibration(s) valid for the whole reporting period?	N/A
Is the calibration carried out for a measuring range comparable with the range for which measurements have been carried out?	N/A
How were the values in the monitoring report verified?	Reported value: 15.67 person-meal/ HH-day A copy of the FT survey/12/ conducted in 2015 was verified, also the value was verified from the previous verification documents and found comparable. /13,14/
If applicable, has the reported data been cross-checked with other available data?	The field surveys are conducted by trained staff of Impact Carbon. The staff trained for conducting the survey was interviewed during the onsite assessment. The team is of the opinion that the kitchen survey has been conducted keeping in mind the requirement of the methodology. The value was found acceptable in view of the technical expert as the value is comparable to the fuel consumed in the previous verifications./2/
Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	FT surveys conducted by the Impact Carbon team were verified from the source survey forms and found satisfactory. /9/

3.4.7 Household who are using more than 1 project stoves; Multi-ICS Usage Adjustment; Fraction

Criteria/Requirements	**Assessment/Observation**
Measuring /Reading /Recording frequency	Annually in June 2015
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology?	The parameter has been included during this verification.
Monitoring equipment	N/A
Is accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer's specification?	N/A

Is the accuracy valid for the entire measuring range or do different accuracy levels apply to different measuring ranges? Calibration frequency /interval:	N/A N/A
Is the calibration interval in line with the monitoring plan and/or methodology? If the monitoring plan does not specify the frequency of calibration, is the selected frequency in accordance with the local/national standards, or as per the manufacturer's specifications?	N/A
Is the calibration of measuring equipment carried out by an accredited person or institution?	N/A
Is (are) calibration(s) valid for the whole reporting period?	N/A
Is the calibration carried out for a measuring range comparable with the range for which measurements have been carried out?	N/A
How were the values in the monitoring report verified?	The values are determined from the Usage survey. For the current monitoring period it comes out to be 8.99% The results were verified from the Usage Surveys sheet submitted to the assessment team. /12/
If applicable, has the reported data been cross-checked with other available data?	The field surveys are conducted by trained staff by Impact Carbon. The staff trained for conducting the survey was interviewed during the onsite assessment. The team is of the opinion that the kitchen survey has been conducted keeping in mind the requirement of the methodology. The value was found acceptable in view of the technical expert and the onsite observations./10,11/
Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Usage surveys conducted by the Impact Carbon team were verified from the source survey forms. The monitoring and data transfer was inline to the prescribed measures and therefore acceptable /9/

3.5 Ex-ante Parameters

Parameter	Assessment
CO2 emission factor arising from use of fuels (wood or wood equivalents) in baseline scenario	The ex-ante value has been applied from the '2006 IPCC Guidelines for National Greenhouse Gas Inventories' prescribed by the applied methodology/4/. The default value is 112,000kg CO_2/TJ. The value applied in MR and ER calculations is consistent.

	However the value for charcoal has been included during the current verification.
Non-CO2 emission factor arising from use of fuels (wood and wood equivalents) in baseline scenario	The ex-ante value has been applied from the '2006 IPCC Guidelines for National Greenhouse Gas Inventories' prescribed by the applied methodology/4/. The default value is 33,952.5 kg CO_2/TJ. The value applied in MR and ER calculations is consistent. However the value for charcoal has been included during the current verification.
CO2 emission factor arising from use of fuels (wood and wood equivalents) in project scenario	The ex-ante value has been applied from the '2006 IPCC Guidelines for National Greenhouse Gas Inventories' prescribed by the applied methodology/4/. The default value is 112,000 kg CO_2/TJ. The value applied in MR and ER calculations is consistent. However the value for charcoal has been included during the current verification.
Non-CO2 emission factor arising from use of fuels (wood and wood equivalents) in project scenario	The ex-ante value has been applied from the '2006 IPCC Guidelines for National Greenhouse Gas Inventories' prescribed by the applied methodology/4/. The default value is 33,952.5 kg CO_2/TJ. The value applied in MR and ER calculations is consistent. However the value for charcoal has been included during the current verification.
Net calorific value of the fuel (wood and wood equivalents) used in the baseline	The ex-ante value has been applied from the '2006 IPCC Guidelines for National Greenhouse Gas Inventories' prescribed by the applied methodology/4/. The default value is 29.5 TJ/GJ. The value applied in MR and ER calculations is consistent. However the value for charcoal has been included during the current verification.
Net calorific value of the fuel (wood and wood equivalents) used in the baseline	The ex-ante value has been applied from the '2006 IPCC Guidelines for National Greenhouse Gas Inventories' prescribed by the applied methodology/4/. The default value is 29.5 TJ/GJ. The value applied in MR and ER calculations is consistent. However the value for charcoal has been included during the current verification.
Non-renewability status of woody biomass fuel in scenario i during year y	The ex-ante value has been applied from the CDM default value. The default value is 0.82. The value applied in MR and ER calculations is consistent with the validated value.

3.6 Sampling Plan

A total number of 456,878 project stoves are sold /16/ in the ambit of project activity since project implementation in 2006. The monitoring of the project is conducted through random sampling prescribed by the applied monitoring methodology/4/. The details of the monitoring are as follows:

1) Monitoring (Kitchen) Survey: the methodology administers a minimum sample size of 100; the PP has conducted 107 surveys/12/ excluding outliers. The MKS forms were reviewed during the onsite assessment, information from where gets transferred to the Survey analysis sheet. The sampling requirement are inline to the applied methodology.

2) Kitchen Performance Test- Project Stove: the results of the survey meet 90/10 Rule which is conservative as per the applied methodology. From a sample of 107 the figure arrived is 0.108.
3) Kitchen Performance Test- Baseline Stove: the project activity was required to do a baseline field test as this is the first verification of the second crediting period. A total of 127 samples identified were surveyed which was found acceptable by the assessment team.
4) Usage survey: a total of 330 stoves were surveyed to meet the criteria set by the applied methodology. 30 stoves of each age was surveyed to arrive at the usage rate.

The sampling performed by the PP was found in accordance with the applied methodology/4/ and it can be concluded that it would result in conservative estimates.

Sampling by the DOE

Earthood team has physically interviewed various project cook stove owners; it was ensured that stoves with age ranging from 0 to 9 years are visited. Also some households with more than one cookstove was visited to observe the usage pattern. The stove owners were questioned about the experience of owning the improved cookstove, the difference they find between the traditional cookstove and ICS and about their charcoal savings. If a user was dissatisfied with the improved cookstove then the response was classified as 'Concerned'; if a person was extremely happy with the product and it was proving to be beneficial to the user then it was classified as 'Positive'; if a unit was proving to be harmful to the user and if the user was extremely dissatisfied then his response was classified as 'Negative'. If the user was indifferent about the utility of cookstove, the response was classified as 'Neutral'. The stove owners were asked about the stove performance and fuel saving after identifying there identity. The usage pattern was also questioned along with the duration of ownership. The list of the stove owners visited are as follows:

Table 3 End User Survey

S.No.	Name of the Cookstove Owner	Mobile numbers*	Feedback (Positive/Negative/Neutral/Concerned)
1	Aidah	0782785405	Positive
2	Beti	0775598062	Positive
3	Richard	0774641016	Positive
4	Sikandi	0775624392	Positive
5	La-Onjo- Kibiraye	0782106599	Positive
6	Ida – Mupesi	0777825261	Positive
7	Amina Ari	0755666550	Positive
8	Hope Najemba	0712026341	Positive
9	Aisha Nagayi	0754686857	Positive
10	Shamim Nayaji	0774621088	Positive
11	Scovio Naswunoi	0773147090	Positive
12	Huine Nakiwa – Amina	0772674404	Positive
13	Shriafa Kasim	0777467613	Positive

14	Mama Masitula	0756487661	Positive
15	Fatuma Nakaye	0774053925	Positive
16	Jaja Ha- Ima	0772480285	Positive
17	Mama Jemiral	0782942409	Positive
18	Masembe Halima	0775547883	Positive
19	Busigye Genevieve	0712632772	Positive
20	Ntungire Mercy	0777340045	Positive
21	Ampumuza Marion	0782554783	Positive
22	Kwesiga Gerald	0712884920	Positive
23	Muzinge Lawrence	0781576151	Positive
24	Kintu Davis	0782838473	Positive
25	Sylivia Ninsiima	0782328956	Positive
26	Waweyo Patrick	0777336352	Positive
27	Mwesigye Maximo	0779356595	Positive
28	Isabirye Fred	0774022718	Positive
29	Patrick Waweyo	0712700226	Positive
30	Mwaka George Willy	0712926464	Positive
31	Amanya Isaac	0776375339	Positive
32	Marion Ampumuza	0782898949	Positive
33	Kengoma Dorothy	0772438662	Positive
34	Mrs Walusimbi	0772889518	Positive
35	Muhangi Denis	0782283238	Positive
36	Namujju Lilian	0782596383	Positive
37	Nshimiyumane John	0772974567	Positive
38	Fred Isabirye	0772307161	Positive
39	Nakazi Aminah	0712572484	Positive
40	Kilwa Livingstone	0771296391	Positive
41	Galiwango Jesca	0774655426	Positive

42	Babirye Resty	0775584587	Positive
43	Nduhukire Elizabeth	0773472881	Positive
44	Waweyo Patrick	0772611497	Positive
45	Mwesigye Maximo	0754725940	Positive
46	Mugumya Morris	0772668126	Positive
47	Royal Light secondary	0772912209	Positive
48	Bishop Seperiano Secondary school	0772830445	Positive
49	Nsambya Junior School - Nsambya Hill	0752980266	Positive
50	Seeta Church of Uganda P/S	0782156568	Positive

**(P.S. Phone numbers have been used means to determine uniqueness and keep track of double counting)*

All the users shared a positive feedback in terms of monetary savings from lesser fuel consumption and were willing to pay a bit of premium to buy ICS when their stove is broken. Several users had been in possession of more than one ICS of different sizes, they were usually the one with a bigger family. Some ICS users also ran small food shops and recognised the improvement in the air quality of their sitting area which contributed a better ambiance. Overall the team is in a position to conclude that the user experience of ICS have been much appreciated by the users.

3.7 Verification of Sustainability Monitoring Parameter

3.7.1 Indicator: Air Quality

Criteria/Requirements	**Assessment/Observation**
Measuring /Reading /Recording frequency	The impact on air quality is assessed biannually.
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology?	Yes,
How were the values in the monitoring report verified?	The value was verified from the source Questionnaires, and physical interviews with the users. /9/
If applicable, has the reported data been cross-checked with other available data?	Yes, through on site interviews and visual observation /9/.
Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes

3.7.2 Indicator: Lively-hood of the poor

Criteria/Requirements	Assessment/Observation
Measuring /Reading /Recording frequency	The parameter is monitored biannually through Kitchen Surveys, Ugastoves sales records, Kitchen Performance tests and Usage survey/11-15/
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology?	Yes
How were the values in the monitoring report verified?	The surveys were verified and the users were physically interviewed during the site visit. Most of the households that were interviewed acknowledged the fact that their charcoal consumption has reduced and thereby the project increases the spending power of the users. /9/
If applicable, has the reported data been cross-checked with other available data?	Yes, through document review/13/, on site interviews and visual observation/9/
Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, database is checked by the project manager on a regular basis

3.7.3 Indicator: Employment

Criteria/Requirements	Assessment/Observation
Measuring /Reading /Recording frequency	Every two years
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology?	Yes, The project has added manufacturing partners over time and which continue to hire and employ locals in administrative, sales, production, and management positions/18/.
How were the values in the monitoring report verified?	The employment information was verified
If applicable, has the reported data been cross-checked with other available data?	Yes, through on site interviews and visual observation /9/.
Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes.

3.7.4 Indicator: Access to affordable and clean energy services

Criteria/Requirements	Assessment/Observation
Measuring /Reading /Recording frequency	It is monitored continuously and Monthly sales records are maintained.
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology?	Yes, monthly sales records are obtained/15/
How were the values in the monitoring report verified?	The surveys were verified and the values reported on salesforce.com were verified and found satisfactory.
If applicable, has the reported data been cross-checked with other available data?	Yes, through on site interviews and visual observation/9/
Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, Questionnaires are administered by Supervisors and checked by the project manager on a regular basis

3.7.5 Indicator: Human and Institutional capacity

Criteria/Requirements	Assessment/Observation
Measuring /Reading /Recording frequency	The monitoring is done every two years.
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology?	Yes
How were the values in the monitoring report verified?	Staff training and manufacture training records were checked during the onsite assessment/9/.
If applicable, has the reported data been cross-checked with other available data?	One of the manufacturer was visited during the onsite assessment and role of the project implementer (Impact Carbon) was assessed. Also the Impact Carbon employees were interviewed during the physical verification.
Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the staff log have been made available to the assessment team.

3.7.6 Indicator: Technological self-reliance

Criteria/Requirements	Assessment/Observation

Measuring /Reading /Recording frequency	The monitoring frequency is every two years.
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology?	Yes
How were the values in the monitoring report verified?	The manufacturers continue to innovate in order to improve the stove technology. Trainings are also provided.
If applicable, has the reported data been cross-checked with other available data?	Interviews were conducted on site during site visits /9/
Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, maintenance survey data collected on handheld devices, stored in Salesforce.com monitoring system and reviewed by office staff /9/ it was found satisfactory.

3.8 Assessment of data and calculation of emission reductions

The emission reductions have been calculated as explained below:

The project emission have been factored in the calculations as per the applied methodology.

The leakage emissions are assessed in the MR as per the applied methodology and found insignificant.

The calculation of baseline emissions are conducted in the ER sheet in clear manner that includes all relevant steps as specified in the applied methodology. The baseline emissions for the project activity are accounted only for the quantity of fuel saved because of the project implementation and does not include emissions from the continued use of the traditional stoves. This was found conservative and complying with the applied methodology. The emission reductions as per the applied methodology are directly calculated and baseline emissions or project emissions are not separately calculated. The emission reductions are calculated based on the equation

$$ERy = \Sigma_{b,p} (N_{p,y} * U_{p,y} * P_{p,b,i,y} * NCV_{b,fuel} * (f_{NRB,b,y} * EF_{fuel,CO2} + EF_{fuel,nonCO2})) - \Sigma LE_{p,y}$$

Where,

$\Sigma_{b,p}$	The sum over all relevant (baseline b/project p) couples.
$N_{p,y}$	Cumulative number of Project Technology Days (176,509,313 days)
$U_{p,y}$	Cumulative Usage rate for technologies in the project scenario p in year y based on cumulative adoption rate and drop off rate; 82.95% (obtained from usage survey)
$P_{p,b,i,y}$	Specific fuel savings for an individual technology of the project against an individual technology in the baseline in tons/day; 0.001496 Ton/HH/day (Derived from baseline KPTs data)
$NCV_{b,fuel}$	Net calorific value of the fuel that is substituted or reduced; 0.0295 TJ/Ton (IPCC default)
$f_{NRB,b,y}$	Non renewability status of woody biomass fuel in scenario i during year y; 0.82 (fixed exante)
$EF_{fuel,CO2}$	CO_2 emission factor arising from use of fuels in baseline scenario; 173.08 tCO_2/TJ (IPCC default)
$EF_{fuel,nonCO2}$	Non CO2 emission factor arising from use of fuels in baseline scenario; 9.886 tCO_2/TJ (IPCC default)
$LE_{p,y}$	Leakage for project scenario in year y (considered zero)

It should be noted that the project also factors the multiple stove owners under a parameter “Multi-ICS Usage Adjustment”. The parameter has been applied to the total number of project technology days. The calculations are checked from “ISS 1 (CP2) - ER Calculation Sheet.xls” for the First Monitoring Period (01 April 2014 – 30 June 2015) of the second crediting period.

The emission reductions for the current monitoring period are higher than the emission reduction estimated in the registered documents. The emission reductions are considerably higher than the estimated amount resulting from the higher improved cook stove sales than anticipated. Also the emission reduction estimation in the register PD the stoves sold during the monitoring period are considered however in actual as per the methodology all operational stoves have been considered for emission reduction calculation. This does not impact the additionality of the project activity as the additionally was demonstrated trough barrier analysis. The verification team verified the sales documents during the onsite assessment and also visited randomly selected households; therefore team is in a position to conclude that the number of stoves sold are real and quantifiable.

3.9 Quality Management

The adequacy and compliance of the monitoring plan in the MR as per the requirement laid out by the monitoring methodology and the registered GS PDD. The information flow (from data generation, aggregation, to recording, calculation and reporting) is already discussed under respective parameter above. The verification team has verified all the data and collected evidence as per the required monitoring frequency and found to be correct and appropriate meeting the requirements of the applied

methodology and the registered GS PDD. The sustainability parameters were also reviewed and the assessment team is of the opinion that the project improves the living standard of the rural population.

The verification team conducted on-site field visits to cross-check the reliability of the data captured in the project survey and conducted interviews with cook-stove users. The verification team found consistency in the response of the users and the data points of the project sample survey.

The assessment team confirms that appropriate methods and formulae for calculating baseline emissions, project emissions and leakage have been followed.

The assessment team confirms that all the emission factors and default values have been correctly justified. All the emission factors and default values are explicitly mentioned in the monitoring report.

4. CERTIFICATION STATEMENT

Earthood Services Private Limited (Earthood), contracted by Impact Carbon, has performed the independent verification of the emission reductions for the GS Project GS447 "Efficient Cooking with Ugastove's Project" in Uganda for the monitoring period 01/04/2015 to 30/06/2015 as reported in the Monitoring Report, Version 3 dated 31/03/2016. The 'Impact Carbon' is responsible for the collection of data in accordance with the monitoring plan and the reporting of GHG emissions reductions from the project activity.

It is our responsibility to express an independent verification statement on the reported GHG emission reductions from the project activity

Earthood commenced the verification on the basis of the baseline and monitoring methodology "Technologies and Practices to Displace Decentralized Thermal Energy Consumption" – 11/04/2011, the monitoring plan contained in the PDD dated 03/03/2014, Monitoring Report Version 3 dated 31/03/2016 as per the methodology described under Section 2 of this report.

Earthood's verification approach is based on the understanding of the risks associated with reporting of GHG emission data and the controls in place to mitigate these. Earthood planned and performed the verification by obtaining evidence and other information and explanations that Earthood considered necessary to give reasonable assurance that reported GHG emission reductions are fairly stated.

In our opinion the GHG emissions reductions reported for the project activity for the period 01/04/2014 to 30/06/2015 are fairly stated in the Monitoring Report (final) Version 3 dated 31/03/2016. The GHG emission reductions were calculated correctly on the basis of the approved baseline and monitoring methodology referred above and the monitoring plan contained in the PDD dated 03/03/2014.

Earthood Services Private Limited is able to certify that the emission reductions from the GS Project GS447 "Efficient Cooking with Ugastove's Project" in Uganda for the monitoring period 01/04/2014 to 30/06/2015 (including both days) amount to **980,920 tCO_2e**. The emission reduction per vintage year is as follows;

Year	Emission Reductions Achieved
01/04/2014 – 31/12/2014	574,103 tCO_2e
01/01/2015 – 30/06/2015	406,817 tCO_2e
Total	980,920 tCO_2e

Abhishek Mahawar

Quality Manager Gurgaon, Haryana, India

Earthood Services Private Limited

5. REFERENCES

S. No.	Title of Document (Version, Date, etc.)
1	a) Registered PDD version 09 dated 24/03/2009, GS ref no.GS447 b) Renewed PDD dated 03/03/2014
2	Previous verification report rev 1.1, dated 4/12/2013
3	Validation Report for renewal of crediting period ref no BVC/KENYA/VAL/005/2013 dated 02/03/2014
4	Applied Methodology: Technologies and Practices to Displace Decentralized Thermal Energy Consumption – 11/04/2011
5	Validation and Verification Standard, version 9.0
6	Monitoring Report, 1.0, 29/07/2015
7	Monitoring Report (final), 3, 31/03/2016
8	ER Calculation Spreadsheet, 3.0, 31/03/2016
9	On site physical observation, surveys, interviews and review of information like records.
10	Baseline Usage Survey 2016
11	Quarterly stove sales spotchecks at stove manufacturers' factories: for Impact Carbon GS 447 For Q3 and Q4 2014 by CIRCODU
12	Kitchen Performance Test and Market Survey Analysis
13	Kitchen Survey Monitoring Report for MP1 CP2
14	Usage survey analysis sheet for MP1 CP2
15	Complete Sales Record and Project Database
16	Detailed Customer Database (KS Results)
17	Charcoal Price Survey Data
18	Partner Retailer List 2014-02-03
19	http://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/2_Volume2/V2_1_Ch1_Introduction.pdf last viewed on 29/02/2016
20	Supportive for incentive mechanism
21	Survey form; kitchen test. A comparison from the older verison

6. AUDIT FINDINGS (CAR/CL/FAR)

Type			**Date**	02/09/2015
CAR # 1			**Reference**	Verification protocol
Description of the Non Conformance				
a) As per the validation report page 6 “A sales receipt contains a unique number that is entered into the project database. The use on this unique number eliminate the risk of double counting of project stoves incase other similar activity exist in areas covered by the project.” However no such mechanism was evident during the desk review or site visit. Kindly clarify. b) PP is requested to provide the collected customer satisfaction information and feedbacks received during this monitoring period c) The information about “Better life” provided in the monitoring repot could not be verified during the onsite assessment. Please clarify.				
1st Response from PP			**Date**	24/02/2016
a) As per applicable methodology’s first condition “The project boundary can be clearly identified, and the technologies counted in the project are not included in another voluntary market or CDM project activity (i.e. no double counting takes place). Project proponents must have a survey mechanism in place together with appropriate mitigation measures so as to prevent double-counting in case of another similar activity with some of the target area in common.” To fulfill this condition, PP maintains all the sales records sold from manufacturer to distributor, retailers and big buyers. This sales record contains unique number specific to stove types/models. These stove types from these manufacturers for particular year are only credited under this project, thus no risk of double counting with other projects. b) The customer satisfaction information and feedbacks are part of the survey and the same has been submitted. c) “BetterLife” was a consumer facing brand used by PP (Impact Carbon), namely for Household Water Purifiers. It was not used for Cookstoves. The related write-up has been deleted from the MR as PP has not included any HH Water Purifier in this monitoring report.				
1st Assessment by Audit Team	**Status**	Closed	**Date**	02/03/2016
a) The sales records mentioned in the response was reviewed and it could be confirmed that the sales database is detailed to include comprehensive information and is centrally controlled document. Therefore it can be concluded that the risk of double accounting is mitigated by the document control. Closed b) The survey forms reviewed during the onsite assessment were verified to gather the customer feedback. It can be concluded that the HH owners are contended with the stove performance. Closed. c) The revised documentation only includes project related text. Closed.				

Type	**Date**	02/09/2015
CAR # 2	**Reference**	Verification protocol

Description of the Non Conformance

For parameter “Stoves sales” the detailed list provided (Annex 04)

a) PP needs to explain the flow of data from the quickbooks maintained by the manufacturers to the final value of emission reductions, as during the site visit the number of stoves sold in the database provided did not match the database at the site.
b) The project database for sales record is not consistent in the field entries.
c) PP needs to clarify the conservativeness in calculations:
    a. If the ICS is sold on the last day of the month, how is it factored in the calculations.
    b. The sales database is based on the list provided by manufacturers, however in certain cases the stoves might be bought by bulk buyers/ retailers. Therefore the dates mentioned by the manufacturer might not be indicative of the stove usage.

1st Response from PP	**Date**	24/02/2016

a) Quickbooks is an accounting program and is used by all manufacturers. Manufacturers export information from the Quickbooks into excel and send that excel as the primary sales database to Imapct Carbon. It contains records of all the stoves from manufacturers to distributors. Impact Carbon than further takes count from retailers of each manufacturer about unsold stoves and then subtract unsolved stoves to get the final numbers of stoves. Hence there is a difference between database at the site and the database provided for ER calculation. The database provided for ER calculation will always have lesser number then primary database and hence it is conservative.
b) Kindly refer to point a) above.
c) Please find the replies to queries as below:
    a. If the ICS is sold on the last day of the month or it is sold on the first day of the month, the emission reduction for those stoves will start from successive month only. This is conservative and calculation has been revised accordingly.
    b. In certain cases the stoves might be bought by bulk buyers and retailors and the dates as indicated in sales record may not be of the indicative stove usage. To adjust this parameter, PP has analyzed the sales records of EUF as it has the highest number of stoves sold (43.9% of the total stoves) in this MP and concluded average inventory period is 27.55 days. PP has adjusted 30 days as inventory period and accordingly the calculation is revised.
    Considering point a. and b. above, it is assumed that stove sold in ‘x’ month has started crediting in ‘x+2’ month.

1st Assessment by Audit Team	**Status**	Closed	**Date**	02/03/2016

a) The PP has explained that the there are two sets of databases; primary and the one used to compute emission reductions. From the primary database the unsold stoves are subtracted. The assessment team is of the opinion that the project proponent has taken measures to avoid the inclusion of the cookstoves which are not in use. The explanation provided was found acceptable, hence the finding is closed

b) Closed.

c) The revised documentation includes complete details about the stove sales database and emission reduction calculation. It can be concluded that the project technology days have been conservatively calculated.

Type			**Date**	02/09/2015
CAR # 03			**Reference**	Verification protocol
Description of the Non Conformance				
For monitored parameter “Quantity of fuel that is consumed in baseline scenario during year y” PP needs to clarify how Berkeley’s report of year 2010 is applicable for the concerned monitoring period, as the recording frequency has been defined every two years.				
1st Response from PP			**Date**	24/02/2016
For monitored parameter “Quantity of fuel that is consumed in baseline scenario during year y”, the value has been revised now. The new value is based on the Baseline Field Test which was conducted after registration and prior to this verification.				
1st Assessment by Audit Team	**Status**	Closed	**Date**	02/03/2016
A recent Baseline field test results have been incorporated in the revised documentation. The parameter has also been updated as per the latest survey, therefore meeting the requirement of the applied methodology. The finding is therefore closed.				

Type	**Date**	02/09/2015
CAR # 04	**Reference**	Verification protocol
Description of the Non Conformance		
PP is requested to explain the following: a) The stoves are not provided any unique number, how is double counting ensured? b) The short survey sheet does not include fields where the surveyor could mention complete information about all the stoves owned by a household. c) During the site visit it was observed that single households owned more than one improved cookstoves; in such cases kindly explain a. How person- meals per household per day is calculated for every stove? b. How are fuel savings calculated in such cases? c. Some stoves might be a replacement of an older stove; how is that factored in the calculations.		

1st Response from PP	Date	24/02/2016

a) The project boundary is defined as whole of Uganda. The project participant records the relevant contact information for as many people as possible who purchase cook stoves. It is mandatory to collect the contact information of all the distributors, retailers and bulk buyers of every kind of stove technology and number of stoves sold to them. This provides the database of project stoves that can be compared to other GHG offset project in country to ensure that double-counting does not occur. Finally, crediting of emission reduction is based on sales receipts and sales records. This ensures that each sale credited is matched to an actual sale. Double counting is avoided by not relying on sampling of homes to determine sales records – instead the sales record is determined exclusively by actual sales and supported by sales records. The sales records are collected by PP (generated from software and then PP randomly screen these records through spot-visits to confirm that sales records are authentic and that no double counting occurs.
Publicly available information on GS VER and CDM stove projects confirms that technologies installed by the project are not being double counted.

b) The short survey was conducted so that data can be used for Usage Survey. If any HH has owned any of the project stoves earlier and is not using any more than it has been included in the short survey. There is no need to collect the information about all the stoves owned by a household to do Usage Analysis hence it was not included.

c) Yes, there are single households owns more than one improved cookstoves. In such cases, it is very complicated to calculate person-meals per household or fuel saving to a particular stove. To factor in such cases in the final ER calculation, the PP adjusted the final sales number. The sales has been discounted being conservative. This is explained as 'Multi-ICS Usage Adjustments' in the monitoring report.

Recent KS data shows that 8.99% of project HHs in the charcoal cluster owned more than one improved cookstoves. Hence 8.99% "Multi-ICS" usage adjustment has been applied to complete sales data.

1st Assessment by Audit Team	Status	Closed	Date	02/03/2016

a) The document control and the flow of the data from the sale of cookstoves to the resulting emission reductions was thoroughly explained and reviewed by the assessment team. Based on the evidences provided it can be concluded that double counting is unlikely. Closed

b) It was understood that the short survey were used for usage analysis and the detailed survey forms are used to conclude baseline/project surveys. Closed

c) The revised MR includes a new parameter "Multi-ICS Usage Adjustments" which indicates the number of households owing more than one cookstoves. The factor is used to adjust the final number of cookstives which shuld be eligible for fuel saving calculations/emission reduction calculation. The parameter is derived from the survey results therefore the finding is closed.

Type	Date	02/09/2015
CAR # 05	Reference	Verification protocol

Description of the Non Conformance				
a) The monitoring report does not include a comparison of the actual GHG emission reductions from project activity to the estimated amount of emission reductions in the PDD.				
1st Response from PP			**Date**	24/02/2016
a) A comparison of the actual GHG emission reductions from project activity to the estimated amount of emission reductions in the PD has been included in Section E of the monitoring report.				
1st Assessment by Audit Team	**Status**	Closed	**Date**	02/03/2016
A comparison of actual v/s estimated emission reduction has been included in the revised MR. the actual emission reduction achieved are much higher than the estimated value which has been attributed to the higher operation cookstoves during the current monitoring period. The same does not affect i) the additionality or ii) applicability of the methodology. Hence closed.				

Type			**Date**	02/09/2015
CAR # 06			**Reference**	Verification protocol
Description of the Non Conformance				
a) The monitoring report clearly indicates that the project includes 456,878 charcoal stoves and 273 institutional wood stoves, however in the calculations only charcoal has been factored in. Kindly explain. b) PP needs to explain the application of the following parameters in the calculations which were not listed (monitored or fixed) in the monitoring report made available: a. NCV of charcoal b. CO_2 emission factor for charcoal that is reduced is substituted c. Non CO_2 emission factor for charcoal that is substituted				
1st Response from PP			**Date**	24/02/2016
a) The monitoring report indicates that the project includes 456,878 charcoal stoves and 273 institutional wood stoves, but the calculation has been done only for charcoal stoves as the number of institutional wood stoves is very less as compared to charcoal stoves. Including institutional wood stoves would have been increased the complexity also. So PP decided to exclude institutional wood stoves and this is conservative also. **b)** In the section B.6.2 of the registered PD; Data and parameters fixed ex ante are presented. It includes parameters like NCV, CO_2 emission factor and Non CO_2 emission factor of fuels (wood or wood equivalents). However the values mentioned in the in the respective tables in registered PD are only of Wood and not of any Wood equivalents. In the project the calculation, survey and all other research is based on charcoal as that is the most used fuel. Accordingly the tables in section D.1 of the MR are also being updated along with these responses.				
1st Assessment by Audit Team	**Status**	Closed	**Date**	02/03/2016

a) The institutional woodstoves have been excluded from the emission reduction calculations. This has been accepted by the assessment on the grounds of conservativeness. Closed

b) From the justification and the revised documentation made available, it is understood that the NCV, CO_2 emission factor and non CO_2 emission factor for charcoal got missed out in the revised PD at the time of renewal. However during the site visit charcoal was observed as the most popular fuel used. Also these values have been used in all the pervious verification for crediting period 1. It has been found fair to include these values in the monitoring report as the source of the values have remained the same only to include the values for charcoal. The updated values are inline to the applied methodology and therefore can be concluded to result in conservative emission reduction. Hence closed.

Type			**Date**	02/09/2015
CAR # 07			**Reference**	Verification protocol
Description of the Non Conformance				
The emission factors and net calorific values provided in the MR and ER sheet are inconsistent among themselves. Also the values provided in the MR are of fuelwood however during the onsite assessment the fuel used was observed as charcoal. Kindly clarify.				
1st Response from PP			**Date**	24/02/2016
The emission factors and net calorific values provided in the MR and ER sheet are revised and are consistent now. In the project the baseline fuel observed is Charcoal and hence for calculation the values of Charcoal is used everywhere. It is everywhere mentioned in the registered PD that Charcoal is used as the fuel in the stoves. However Section B.6.2 of the registered PD only listed parameters for fuel-wood. To correct this inconsistency the PP has decided to use the parameters for charcoal to calculate the Emission Reduction. The correction has been presented in section B.2.2. of the MRv2.				
1st Assessment by Audit Team	**Status**	Closed	**Date**	02/03/2016
The revised documentation is consistent in terms of all the values. Hence closed.				

Remaining FAR from validation and/or previous verification

Type	**Date**	02/09/2015
FAR # 01	**Reference**	Verification protocol

Description of the FAR				
The Project boundary is being extended to the whole country, which includes rural and urban hhs of Uganda. The current baseline survey clearly indicates the fuel choices, however does not provide much information on the fuel consumption level in rural and urban HHs. Therefore it is difficult to conclude that along with other similarities like cooking frequency, meal preference the level of fuel consumption will be similar for rural and urban population. It is recommended that the PP shall design the KPT sample size with fair representation of both rural and urban population to assess if there is a need of further division of project scenarios based on fuel consumption level.				
1st Response from PP			**Date**	24/02/2016
The KPT sample size for the monitoring period was designed in such a way that it should fair represent of both rural and urban population. There were total of 107 sample surveys after out liars. Out of 107 surveys 59 were Rural and 48 were Urban. Fuel consumption level for Rural has been assessed at 0.116 Kg/person-meal and for Urban it has been assessed at 0.100 Kg/person-meal and the mean value is 0.108 Kg/person-meal. There is a deviation of less than 10%. Also other parameters in the survey clearly show that there are no differences in the cooking practices on the Rural and Urban basis. Hence fuel consumption is similar at all Rural and Urban level and hence no requirement of further division of project scenarios based on fuel consumption level				
1st Assessment by Audit Team	**Status**	Closed	**Date**	02/03/2016
It is clear from the survey results and the clarification provided that the PPs sample included a representative share of both urban and rural population. The value for fuel consumption vary less than 10% between the urban and rural sample HHs. The PP has used an average of the 2 for the emission reduction computation, hence it is fair to assume that the final emission reduction considers both urban and rural population. Therefore, it has been found unnecessary by the assessment team to further divide the project scenarios based on fuel consumption in urban and rural setups. Closed				

7. CV OF VERIFICATION TEAM

Competence Statement			
Name	Shreya Garg		
Country	India		
Education	M.Sc. (Climate Science & Policy), TERI University		
Experience	4 Years. She has completed more than 4 GS projects which includes one GS verification in Uganda.		
Field	Climate Change		
Approved Roles			
Team Leader	YES		
Validator	YES		
Verifier	YES		
Financial Expert	NO		
Technical Reviewer	YES		
TA Expert (1.2)	YES		
Reviewed by	Abhishek Mahawar	**Date**	29/12/2014
Approved by	Ashok Gautam	**Date**	29/12/2014

Competence Statement			
Name	Ashok Gautam		
Country	India		
Education	M. Sc. (Environmental Sciences) M. Tech. (Energy & Environmental Management)		
Experience	14 Years		
Field	Energy, Climate Change & Environment		
Approved Roles			
Team Leader	YES		
Validator	YES		
Verifier	YES		
Financial Expert	NO		
Technical Reviewer	YES		
TA Expert (1.1)	YES		
TA Expert (3.1)	YES		
TA Expert (13.1)	YES		
Reviewed by	Abhishek Mahawar	**Date**	29/12/2014
Approved by	Kaviraj Singh	**Date**	29/12/2014

Competence Statement			
Name	Kaviraj Singh		
Country	India		
Education	Ph.D. (Environmental Engineering), IIT Delhi M.Phil. (Energy & Environmental), DAVV Indore		
Experience	8 Years		
Field	Climate Change & Environment		
Approved Roles			
Team Leader	YES		
Validator	YES		
Verifier	YES		
Financial Expert	NO		
Technical Reviewer	YES		
TA Expert (1.2)	YES		
TA Expert (13.1)	YES		
TA Expert (13.2)	YES		
TA Expert (15.2)	YES		
Reviewed by	Abhishek Mahawar	**Date**	30/03/2014
Approved by	Ashok Gautam	**Date**	30/03/2014

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

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