




**Verification and certification report form for
CDM project activities
(Version 02.1)**

BASIC INFORMATION

Title and UNFCCC reference number of the project activity	Efficient Fuel Wood Stoves for Nigeria UNFCCC reference number: 2711
Version number of the verification and certification report	4
Completion date of the verification and certification report	09/02/2018
Monitoring period number and duration of this monitoring period	MP 07 01/07/2016 – 30/06/2017 (inclusive of both the days)
Version number of the monitoring report to which this report applies	03
Crediting period of the project activity corresponding to this monitoring period	12/10/2009 – 11/10/2019
Project participants	Developmental Association for Renewable Energies atmosfair gGmbH Lernen-Helfen-Leben e.V.
Host Party	Nigeria
Applied methodologies and standardized baselines	AMS II.G., version 1 (EB37), "Energy Efficiency Measures in Thermal Applications of Non-Renewable Biomass"
Mandatory sectoral scopes linked to the applied methodologies	3: Energy demand
Conditional sectoral scope(s) linked to the applied methodologies	Not applicable
Estimated amount of GHG emission reductions or GHG removals for this monitoring duration in the registered PDD	34,027 tCO ₂ e
Certified amount of GHG emission reductions or GHG removals for this monitoring period	12,685 tCO ₂ e
Name and UNFCCC reference number of the DOE	Carbon Check (India) Private Ltd. E-0052
Name, position and signature of the approver of the verification and certification report	Vikash Kumar Singh, Compliance Officer 

SECTION A. Executive summary

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Purpose, general description and location of the project activity:

The project participant atmosfair gGmbH has commissioned the DOE, Carbon Check (India) Private Ltd. (CC IPL) to perform an independent verification of the CDM project activity "Efficient Fuel Wood Stoves for Nigeria" in Nigeria (hereafter referred to as the "project activity"). The project activity includes distribution of energy efficient stoves for cooking purposes. The project activity saves greenhouse gas emissions by replacing baseline stoves with improved cookstoves.

This report summarises the findings of the verification of the project activity, performed on the basis of the paragraph 62 of the CDM M & P, as well as the 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 the request for issuance of CERs. This report contains the findings and resolutions from the verification and a certification statement for the certified emission reductions.

Verification is the periodic independent review and ex-post determination of both quantitative and qualitative information by a Designated Operational Entity (DOE) of the monitored reductions in GHG emissions that have occurred as a result of the registered CDM project activity 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 is to verify and certify emission reductions reported for the project activity "Efficient Fuel Wood Stoves for Nigeria" in the host country "Nigeria" for the period 01/07/2016 to 30/06/2017 (including both the days).

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

In particular, the monitoring plan, monitoring report and the project's compliance with the relevant UNFCCC and the 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 PDD and the approved monitoring methodology.

Scope of the verification:

The scope of the verification is:

1. To verify the project implementation and operation with respect to the registered PDD
2. To verify the implemented monitoring plan with the registered PDD or approved revised PDD and applied baseline and monitoring methodology.

3. To verify that the actual monitoring systems and procedures are in compliance with the monitoring systems and procedures described in the monitoring plan.
4. 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.
5. To verify that the reported GHG emission data is sufficiently supported by evidence.

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

Verification process:

The verification comprises a review of the monitoring report over the monitoring period from 01/07/2016 to 30/06/2017 and based on the registered PDD /B05/ in part of the monitoring parameters and monitoring plan, emission reduction calculation spreadsheet, monitoring methodology and all related evidence provided by the project participant.

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

Conclusion:

The verification team assigned by the DOE concludes that the PDD (Version 3, dated 18/02/2013) /B05/ and the monitoring report (version 03, dated 12/01/2018) /02/, meets all the relevant requirements of the UNFCCC for CDM project activities/ programme of activities including article 12 of the Kyoto Protocol and paragraph 62 of CDM M& P, the modalities and procedures for CDM (Marrakesh Accords) and the subsequent decisions by the COP/MOP and CDM Executive Board. The verification has been conducted in-line with the CDM VVS for project activities, version 01.0 /B01-1/ requirements.

The project activity was correctly implemented according to selected monitoring methodology, monitoring plan and the registered PDD. The monitoring system was installed, maintained in a proper manner, while collected monitoring data allowed for the verification of the amount of achieved GHG emission reductions. Through the review and on site visit the verification team confirms that the project activity has resulted in the 12,685 tCO₂e emission reductions during the seventh monitoring period.

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

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

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)	Involvement in			
						Desk/document review	On-site inspection	Interviews	Verification findings
1.	Team Leader / Technical Expert	IR	Agarwalla	Sanjay Kumar	CC IPL	X	X	X	X
2.	Local Expert	EI	Sunday	Siyambola	CC IPL		X	X	
3.	Team Member	IR	Sharma	Kranav	CC IPL	X			

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

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

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

No.	Risk that could lead to material errors, omissions or misstatements	Assessment of the risk		Response to the risk in the verification plan and/or sampling plan
		Risk level	Justification	
1.	Human Error: Recording and reporting of the information in the ER spreadsheet.	Medium	All the ER spreadsheet data of the stoves, including sales database, determination of parameter for efficiency testing including data calculation. This includes all the parameters to be monitored ex-post as per the registered PDD.	The risk has been mitigated by the training of the personnel involved in the data capture, calculation and by following the monitoring responsibilities. The training records have been checked by the verification team /11/.
2.	Information System: Use of spreadsheets without adequate controls related to data changes/updates, version tracking, traceability, security	Medium	The data is recorded in the spreadsheets based on the raw data collected during the field visits. The access to the spreadsheets for calculation of ERs, monitoring and sales database and Stove efficiency testing records.	The identified risk has been mitigated by managing access to the records. It was confirmed through interviews that the raw data is collected by the field agents and then transmitted and stored electronically to the PP's office. The data quality control is maintained by the Assigned Monitoring Officer.
3.	Accuracy of the measuring equipment	Medium	Check the calibration records for the measurement equipment.	The risk due to accuracy of the measuring equipment has been ensured by planning to check calibration certificates /7/ of the measuring equipment used for

				stove efficiency (water boiling tests).
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C.2. Consideration of materiality in conducting the verification

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The threshold of materiality was evaluated based on §13 of “Guideline: Application of materiality in verifications” Version 02.0 /B04/. It was concluded that the materiality threshold applicable to the project activity based on actual emission reductions achieved is 5% of 12,685 tCO_{2e} which is equal to 634 tCO_{2e}.

In planning the verification, verification team took cognizance of para 11 and 12 of the “Guideline: Application of materiality in verifications” Version 02.0 /B04/. A materiality threshold of 607 tCO_{2e} is determined in line with para 13(a) of “Guideline: Application of materiality in verifications” Version 02.0 /B04/.

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 Project Participant (s) (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 para 13-17 of the “Guideline: Application of materiality in verifications” Version 02.0 /B04/ 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 Project Participant) to the electronic monitoring database. Data flow was checked through comparison of data in hand written forms, electronic database and ER sheet. The training records of the personnel involved in conducting the stove efficiency testing, recording of data and calculation of the emission reductions data has been checked by the verification team /11/.

The risks identified were mitigated through cross check with all sets of documents. The verification team performed the following checks in order to mitigate the effects of the above-identified sources of error:

Mitigation of Human error risks: The verification team mitigated the risk by checking the training records /11/ of the personnel during the on-site visit. These records have been provided to the verification team by the PP. Further, data was crosschecked with the ER calculation spreadsheet /04/ and the raw data spread sheet /06/. Verification team, based on the above, confirms that the risk is appropriately mitigated.

Mitigation due to error in Information system: Verification team by conducting interviews with the personnel responsible for such activities mitigated the risk due to error in information system. It was confirmed through interviews that the raw data is collected by the field agents and then transmitted and stored electronically to the PP’s office. The data quality control is maintained by the Assigned Monitoring Officer from the PP.

Accuracy of the measuring equipment: The risk due to inaccuracy in measurements is assessed by reviewing calibration certificates of all the project equipment. The verification team has reviewed the dates of calibration and to check whether all equipment is being calibrated at regularly defined intervals as per the registered PDD /B05/.

Based on the review of the PDD /B05/, monitoring report /02/, emission reduction calculation spread sheet /04/ and the data provided and the assessment carried out above, CCIPL confirms with a reasonable level of assurance that the claimed emission reductions or removals are free from material errors, omissions or misstatements.

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SECTION D. Means of verification

D.1. Desk/document review

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List of all documents reviewed or referenced during the validation is provided in Appendix-3 below.

D.2. On-site inspection

Duration of on-site inspection: 24/07/2017 to 01/08/2017				
No.	Activity performed on-site	Site location	Date	Team member
1.	An assessment of the implementation and operation of the registered project activity as per the registered PDD	Nigeria (Kaduna, Zaria)	24/07/2017 to 01/08/2017	Sanjay Agarwalla, Shyanbola Sunday
2.	A review of information flows for generating, aggregating and reporting the monitoring parameters	Nigeria (Kaduna, Zaria)	24/07/2017 to 01/08/2017	Sanjay Agarwalla, Shyanbola Sunday
3.	Interviews with relevant personnel to determine whether the operational and data collection procedures are implemented in accordance with the monitoring plan in the PDD	Nigeria (Kaduna, Zaria)	24/07/2017 to 01/08/2017	Sanjay Agarwalla, Shyanbola Sunday
4.	A cross check between information provided in the monitoring report and data from other sources such as plant logbooks, inventories, purchase records or similar data sources	Nigeria (Kaduna, Zaria)	24/07/2017 to 01/08/2017	Sanjay Agarwalla, Shyanbola Sunday
5.	A check of the monitoring equipment including calibration performance and observations of monitoring practices against the requirements of the PDD and the selected methodology and corresponding tool(s), where applicable	Nigeria (Kaduna, Zaria)	24/07/2017 to 01/08/2017	Sanjay Agarwalla, Shyanbola Sunday
6.	A review of calculations and assumptions made in determining the GHG data and emission reductions	Nigeria (Kaduna, Zaria)	24/07/2017 to 01/08/2017	Sanjay Agarwalla, Shyanbola Sunday
7.	An identification of quality control and quality assurance procedures in place to prevent or identify and correct any errors or omissions in the reported monitoring parameters	Nigeria (Kaduna, Zaria)	24/07/2017 to 01/08/2017	Sanjay Agarwalla, Shyanbola Sunday

D.3. Interviews

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1.	Oshaniwa	Toyin	atmosfair gGmbH	24/07/2017 to 01/08/2017	Project implementation and operation, monitoring procedure, data and information flow, CER calculation and completeness of monitoring report, QA/QC Procedures, Stove Efficiency Tests procedures and records, Quality Assurance – Management and operating system	Sanjay Agarwalla, Shyanbola Sunday
2.	Olajide	Rachel	atmosfair gGmbH	24/07/2017 to 01/08/2017	Monitoring procedure, QA/QC Procedures, Stove Efficiency Tests, Quality Assurance – Management and operating system	Sanjay Agarwalla, Shyanbola Sunday
3.	Olorunmaiye	Tosin	atmosfair gGmbH	24/07/2017 to 01/08/2017	Monitoring procedure, QA/QC Procedures, Stove Efficiency Tests, Quality Assurance – Management and operating system	Sanjay Agarwalla, Shyanbola Sunday
4.	Zerzawy	Florian	atmosfair gGmbH	21/07/2017 (via skype)	Project implementation and operation, monitoring procedure, data and information flow, CER calculation and completeness of monitoring report, QA/QC Procedures, Stove Efficiency Tests, Quality Assurance – Management and operating system	Sanjay Agarwalla

D.4. Sampling approach

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The total population size of the improved cook stoves distributed under this monitoring period is 5,370. The monitoring parameters required to be monitored through the sampling plan are “Number of SAVE80 systems in use per vintage” ($N_{y,i}$) and “Efficiency of the SAVE80 system for each vintage” ($\eta_{new,i}$).

For the monitoring parameter “ $N_{y,i}$ ”, sampling was done based on a survey of 100 households and a dropout rate of 11 % was observed in the survey as has been checked from the spot check records and verified during the onsite visit. In accordance with the INQ-04074-EB /13/, the monitoring activity was undertaken along with the verification by the verification team. The verification team was able to survey (verify) all the households visited as part of the monitoring survey (PP’s set of records), thus the acceptance sampling as described in the steps indicated in paragraphs 25–32 of the sampling standard, version 07 /B06/ is not applicable in this case. Verification team based on OSV verification, confirms the correctness of the drop-out rate and thus PP’s set of records has been accepted.

Verification team further confirms that the sampling plan and the parameter values are in accordance with the clarification letter provided by UNFCCC secretariat /13/ and the revised monitoring plan provided in revised PDD /B05/. The sample chosen by the PP has been selected at random.

For the monitoring parameter $\eta_{new,i}$ the water boiling test were conducted and the values determined for 3 stoves. Three different tests have been conducted for 3 different stoves and average value has been used according to the equation provided in the monitoring report. Further an average from the observation of values for previous monitoring periods has also been used. This is in accordance with the registered monitoring plan and the previous monitoring reports /B05/.

The verification team checked the water boiling test reports /6/ with records of all the sampled stoves for the verification of the stove efficiency of the project stoves. No sampling was required for the verification of the tests of the efficiency conducted.

D.5. Clarification requests (CLs), corrective action requests (CARs) and forward action requests (FARs) raised

Areas of verification findings	No. of CL	No. of CAR	No. of FAR
Compliance of the monitoring report with the monitoring report form	00	00	00
Compliance of the project implementation and operation with the registered PDD	00	00	00
Post-registration changes	00	00	00
Compliance of the registered monitoring plan with the methodologies including applicable tools and standardized baselines	00	00	00
Compliance of monitoring activities with the registered monitoring plan	02	00	00
Compliance with the calibration frequency requirements for measuring instruments	00	00	00
Assessment of data and calculation of emission reductions or net removals	00	00	00
Assessment of reported sustainable development co-benefits	00	00	00
Global stakeholder consultation	00	00	00
Others (please specify)	00	00	00
Total	02	00	00

SECTION E. Verification findings**E.1. Compliance of the monitoring report with the monitoring report form**

Means of verification	Document Review, Interview
Findings	-
Conclusion	<p>The verification team has determined whether the monitoring report was completed using the valid version of the applicable monitoring report form /B03/. The verification team has checked whether all the sections of the monitoring report follow the guidelines provided in the template and instruction text requirement.</p> <p>Verification team confirms that the latest available version of monitoring report template /B03/ has been used by the PP and the MR /02/ is in compliance of the monitoring report form and instructions therein.</p> <p>CC IPL, had made the version 01, dated 03/11/2017 of the monitoring report /01/, covering the monitoring period from 01/07/2016 to 30/06/2017 (both days inclusive) publicly available on 09/11/2017 through its dedicated interface on the UNFCCC website /B07-1/. The site visit was conducted prior to submitting monitoring report for public availability in accordance with the clarification letter issued by the UNFCCC Secretariat /13/ before undertaking the site visit for the verification team from 24/07/2017 to 01/08/2017.</p> <p>This confirms compliance with the §355 and §356 of CDM VVS for project activities, version 01.0 /B01-1/.</p>

E.2. Remaining forward action requests from validation and/or previous verifications

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There was one forward action request from validation which was resolved during first verification. Also there was one forward action request during first periodic verification which was resolved during the subsequent verification. There is no forward action request from the previous verification of the project activity.

E.3. Compliance of the project implementation and operation with the registered project design document

Means of verification	Document Review, Interview														
Findings	-														
Conclusion	<p>The project activity was implemented, and project devices distributed as described in the registered PDD /B05/.</p> <p>The implementation of the project activity is summarized below:</p> <table border="1"> <tr> <td>Project Participants:</td> <td>Developmental Association for Renewable Energies; atmosfair gGmbH; Lernen-Helfen-Leben e.V.</td> </tr> <tr> <td>Title of project activity:</td> <td>Efficient Fuel Wood Stoves for Nigeria</td> </tr> <tr> <td>UNFCCC registration No:</td> <td>2711</td> </tr> <tr> <td>Applied Baseline and monitoring methodology:</td> <td>AMS-II.G (version 01)</td> </tr> <tr> <td>Project Scale:</td> <td>Small scale</td> </tr> <tr> <td>Location of the project activity:</td> <td>Federal Republic of Nigeria</td> </tr> <tr> <td>Project's crediting period:</td> <td>12/10/2009 to 11/10/2019</td> </tr> </table>	Project Participants:	Developmental Association for Renewable Energies; atmosfair gGmbH; Lernen-Helfen-Leben e.V.	Title of project activity:	Efficient Fuel Wood Stoves for Nigeria	UNFCCC registration No:	2711	Applied Baseline and monitoring methodology:	AMS-II.G (version 01)	Project Scale:	Small scale	Location of the project activity:	Federal Republic of Nigeria	Project's crediting period:	12/10/2009 to 11/10/2019
Project Participants:	Developmental Association for Renewable Energies; atmosfair gGmbH; Lernen-Helfen-Leben e.V.														
Title of project activity:	Efficient Fuel Wood Stoves for Nigeria														
UNFCCC registration No:	2711														
Applied Baseline and monitoring methodology:	AMS-II.G (version 01)														
Project Scale:	Small scale														
Location of the project activity:	Federal Republic of Nigeria														
Project's crediting period:	12/10/2009 to 11/10/2019														

Reported monitoring Period verified in this verification:	01/07/2016 to 30/06/2017
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As a part of the site visit, the verification team was able to confirm that the project implementation is in accordance with the project description contained in the registered PDD and approved revised PDD of 18/02/2013 /B05/ including the applied methodology /B02/.

Till the end of the monitoring period 5,370 SAVE80 cookstove units had been disseminated in the project activity. The stoves have been distributed across different locations in the Guinea Savannah Zone of Nigeria.

The project activity includes distribution of energy efficient stoves for cooking purposes. The stove design is based on SAVE80 design /10/. The interior parts of "Save80" are made of stainless steel to ensure a life-span of many years, high efficiency and burning at high temperatures for complete combustion with the low emission of smoke. The stove comes with a heat retaining box called "Wonderbox". The "Wonderbox" is used for cooking with retained heat and for conserving high temperature of the content for many hours. It is suited to the 8-litre-pot (with lid) of "Save80". The technology used in the stoves claims to save 80% firewood consumption of a traditional three-stone-fire.

The information (including data and variables) provided in the MR /02/ have been found to be in line with the details provided in the approved revised PDD /B05/.

The starting date of the Project Activity is 01/04/2008, that is when the stoves were first disseminated in the project activity. The total number of stoves distributed till the end of monitoring period is 5,370. The sample sales receipt provided confirm the CER waiver agreement with the households /05/. Operation of the devices was confirmed during the site visit by the verification team. Following was verified at the project site:

1. Electronic monitoring system
2. Actual implementation of the stoves
3. Household-representatives were interviewed regarding the usage of stove
4. Whether or not baseline technology was still in use
5. Process of data collection during installation of stove
6. Agreements between households and Project Participant.

CCIPL's verification team confirms that the project activity is implemented within the boundary of the project activity as described in the PDD /B05/ and the implementation and operation of the project activity has been conducted in accordance with the description contained in the revised PDD /B05/.

In summary, the monitoring period is reasonable, and the operation of the project activity is in accordance with the registered PDD /B05/.

There were no changes observed during OSV from the technology stated during the validation and earlier verifications.

Procedures for tracking of changes of ownership and/or relocations of SAVE80 systems have been implemented to address FAR01 during the first verification. This has been implemented in the monitoring system of the PP and the changes have been reflected for the households in the project database /09/.

The verified timeline of the project's implementation is as follow:

Milestone of the project activity	Timeline	Assessment by the verification team
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Starting date of operation:	01/04/2008	The sales and distribution of first stoves started on 01/04/2008. This was validated during the registration /B05/ of the project activity.
Registration of the project activity	12/10/2009	The project got registered on 12/10/2009 /B07-3/.
Crediting period		
1st monitoring period	12/10/2009 – 30/06/2010	Issuance complete /B07-3/
2nd monitoring period	01/07/2010 – 30/06/2012	Issuance complete /B07-3/.
3rd monitoring period	01/07/2012 – 30/06/2013	Issuance complete /B07-3/.
4th monitoring period	01/07/2013 – 30/06/2014	Issuance complete /B07-3/.
5th monitoring period	01/07/2014 – 30/06/2015	Issuance complete /B07-3/.
6th monitoring period	01/07/2015 – 30/06/2016	Request for issuance submitted
7th monitoring period	01/07/2016 – 30/06/2017	Monitoring period for verification.

A joint site visit was undertaken for monitoring and verification for the project activity in accordance with the clarification reference INQ-04074-EB /13/. As part of the site visit the verification team was able to confirm that the project implementation is in accordance with the project description contained in the registered PDD and approved revised PDD of 18/02/2013 /B05/. The verification team took cognizance of §341 (b)(i), §357, §358 and §359 of CDM VVS for project activities, version 01 /B01-1/.

CC IPL's verification team considers the project description of the project contained in the registered PDD and approved revised PDD /B05/ to be complete and accurate. The PDD complies with the relevant methodology, tools, forms and guidance at the time of PDD submission for registration /B05/.

E.4. Post-registration changes

E.4.1. Temporary deviations from the registered monitoring plan, applied methodologies or applied standardized baselines

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There are no temporary deviations from the registered monitoring plan, monitoring methodology or standardized baseline.

E.4.2. Corrections

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There are no corrections submitted with the request for issuance for the current monitoring period. However, a post registration change has been approved for the project activity with reference number PRC-2711-001 during the third monitoring period.

E.4.3. Change to the start date of the crediting period of the project activity

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There are no changes to the start date of the crediting period.

E.4.4. Inclusion of a monitoring plan

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There are no changes to the monitoring plan of the registered project activity.

E.4.5. Permanent changes from registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines or other applied standards or tools

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There are no permanent changes from the registered monitoring plan, applied methodology or standardized baseline during this monitoring period or submitted with this monitoring report.

E.4.6. Changes to the project design

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There are no permanent changes from the registered monitoring plan, applied methodology or standardized baseline during this monitoring period or submitted with this monitoring report.

E.4.7. Changes specific to afforestation and reforestation project activities

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Not applicable, since the project activity is not an afforestation and reforestation project activity.

E.5. Compliance of the registered monitoring plan with the methodology including applicable tools and standardized baselines

Means of verification	Document Review, Interview
Findings	-
Conclusion	<p>The verification team is able to confirm that the monitoring plan contained in the registered PDD /B05/ is in accordance with the approved methodology applied by the project activity, i.e. AMS-II.G (version 1) /B02/. The verification team determined against all the information provided in the MR /02/, whether it is in-line with the applied monitoring methodology. The calculation of emissions has been done in accordance with the formulae and methods described in monitoring plan and the applied methodology. 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 the households and the PP and the observations during OSV.</p> <p>The verification team took cognizance of §360, 361 and §362 of CDM VVS for project activities, version 01 /B01-1/.</p>

E.6. Compliance of monitoring activities with the registered monitoring plan**E.6.1. Data and parameters fixed ex ante or at renewal of crediting period**

Means of verification	Document Review, Interview
Findings	-
Conclusion	<p>The verification team confirms that the data and parameters fixed ex-ante are in compliance with the registered PDD and its monitoring plan /B05/.</p> <p>Detailed assessment of each parameter has been provided in Appendix-5.</p> <p>The verification team took cognizance of §363 of CDM VVS for project activities, version 01 /B01-1/.</p>

E.6.2. Data and parameters monitored

Means of verification	Document Review, Interview
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Findings	CL 01 and CL 02 had been raised.
Conclusion	<p>The verification team confirms that the data and parameters monitored are in compliance with the registered PDD and the monitoring plan /B05/.</p> <p><u>Assessment of Data information flow:</u></p> <p>The stove population was arranged chronologically by the PP and each stove was assigned a serial number for sampling. A random number generator was used to generate random numbers and the stoves with the same serial number were sampled from population for monitoring.</p> <ol style="list-style-type: none"> 1. The verification team checked the random numbers generated and verified that the samples selected for monitoring were adhering to the same random numbers in the population. 2. The verification team checked the WBT records and verified that the values mentioned in the ER spread sheet for stove efficiency were consistent with the primary records. 3. The verification team checked the monitoring equipment used for testing and their calibration status to verify that the values monitored using the equipment were reliable. 4. The verification team interviewed personnel involved in stoves efficiency testing and found them competent for conducting WBTs. <p>Thus, it is confirmed that the verification team assessed the data / information flow from the point of monitoring to emission reduction calculation and found no gap in the same.</p> <p>Detailed assessment of each parameter has been provided in Appendix-6.</p> <p>The verification team took cognizance of §363, §364 and 367 of CDM VVS for project activities, version 01 /B01-1/.</p>

E.6.3. Implementation of sampling plan

Means of verification	Document Review, Interview
Findings	-
Conclusion	<p>The total population size of the improved cook stoves distributed under this monitoring period is 5,370. The monitoring parameters required to be monitored through the sampling plan are “Number of SAVE80 systems in use per vintage” ($N_{y,i}$) and “Efficiency of the SAVE80 system for each vintage” ($\eta_{new,i}$).</p> <p>For the monitoring parameter “$N_{y,i}$”, sampling was done based on a survey of 100 households and a dropout rate of 11 % was observed in the survey as has been checked from the spot check records and verified during the on-site visit. In accordance with the INQ-04074-EB /13/, the monitoring activity was undertaken along with the verification by the verification team. The verification team was able to survey (verify) all the households visited as part of the monitoring survey (PP’s set of records), thus the acceptance sampling as described in the steps indicated in paragraphs 25–32 of the sampling standard, version 07 /B06/ is not applicable in this case. Verification team based on OSV verification, confirms the correctness of the drop out rate and thus PP’s set of records has been accepted.</p> <p>Verification team further confirms that the sampling plan and the parameter values are in accordance with the clarification letter provided by UNFCCC secretariat /13/ and the revised monitoring plan provided in the revised PDD /B05/. The sample chosen by the PP has been selected at random.</p> <p>For the monitoring parameter “$\eta_{new,i}$”, water boiling tests were conducted and the values determined for 3 stoves. Three different tests have been conducted for 3</p>

	<p>different stoves and average value has been used according to the equation provided in the monitoring report. Further an average from the observation of values for previous monitoring periods has also been used. This is in accordance with the registered monitoring plan and the previous monitoring reports /B05/.</p> <p>DOE checked the water boiling test report /6/ with records of all the sampled stoves for the verification of the stove efficiency of the project stoves. No sampling was required for the verification of the tests of the efficiency conducted.</p>
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E.7. Compliance with the calibration frequency requirements for measuring instruments

Means of verification	Document Review, Interview
Findings	-
Conclusion	<p>The monitoring plan does not require any specific monitoring equipment for the monitoring of the monitoring parameters. Calibration was undertaken only for thermometer and was done before conducting water boiling tests. No other calibration of any other equipment was required as per monitoring plan. The appropriate QA/QC procedures have been followed for the monitoring parameters.</p> <p>In summary, the verification team is able to verify that the accuracy of the monitoring equipment was set according to the registered monitoring plan. Furthermore, the verification team confirms all calibration procedures were carried at the frequency as specified by the methodology, monitoring plan of the registered PDD or the approved revised monitoring plan and aligned with the manufacturer specifications. Therefore, accuracy of monitoring equipment's is assured. The verification team took cognizance of §368 of CDM VVS for project activities, version 01 /B01-1/.</p>

E.8. Assessment of data and calculation of emission reductions or net removals

In line with the requirement of § 375 of CDM VVS for project activities, version 01.0, verification team has reviewed the Monitoring report and ER spread sheet to check the arithmetic calculation of the emission reductions. The equation used for the calculation is compared with those provided in the registered PDD /B05/ and the applied methodology AMS-II.G, version 1 /B02/ and found to be correct.

E.8.1. Calculation of baseline GHG emissions or baseline net GHG removals by sinks

Means of verification	Document Review, Interview
Findings	-
Conclusion	<p>The equations for baseline emissions as provided in the monitoring report /02/ and confirmed with the registered PDD /B05/ and the methodology AMS-II.G, version 01 /B02/ are:</p> $ER_y = B_{y,savings} \cdot f_{NRB,y} \cdot NCV_{biomass} \cdot EF_{projected_fossilfuel}$ <p>Where:</p> <p>ER_y Emission reductions during the year in t CO₂e</p> <p>B_{y,savings} Quantity of biomass that is saved in tonnes</p> <p>f_{NRB,y} Fraction of biomass saved by the project activity in year y that can be established as non-renewable biomass using survey methods</p> <p>NCV_{biomass} Net calorific value of non-renewable biomass that is substituted (IPCC default value for fuel wood 0.015 TJ/tonne, i.e. 15 MJ/kg wood)</p> <p>EF_{projected_fossilfuel} Emission factor for the substitution of non-renewable biomass by similar consumers</p>

	<p>Calculation of Biomass Savings ($B_{y,savings}$):</p> $B_{y,savings} = \sum_{i=1}^n B_{y,adjusted,i} \cdot \left(1 - \frac{\eta_{old}}{\eta_{new,i}}\right)$ $= \sum_{i=1}^n B_{y,appliance} \cdot L_y \cdot N_{y,i} \cdot \left(1 - \frac{\eta_{old}}{\eta_{new,i}}\right)$ <p>Where:</p> <p>$B_{y,adjusted,i}$ Adjusted quantity of biomass used in the absence of the project activity (tonnes/year/vintage)</p> <p>$B_{y,appliance}$ Average annual biomass consumption per appliance (tonnes/year) (remains fixed throughout the crediting period)</p> <p>L_y Leakage Correction Factor (remains fixed throughout the crediting period)</p> <p>$N_{y,i}$ Number of appliances operating per year and vintage</p> <p>η_{old} Efficiency of the system being replaced, measured using representative sampling methods or based on referenced literature values (fraction) (remains fixed throughout the crediting period)</p> <p>$\eta_{new,i}$ Efficiency of the system</p> <p>Number of appliances operating per year ($N_{y,i}$):</p> $N_{y,i} = \sum_{i=1}^{N_{y,i}} n_{y,i} \cdot t_{y,i}$ <p>Where:</p> <p>$n_{y,j}$ = Appliance operating per year and vintage</p> <p>$t_{y,j}$ = Fraction of operation time per SAVE80 system per vintage (months/months per year).</p> <p>The verification took cognizance of § 375 of CDM VVS for project activities, version 01.0) /B01-1/.</p>
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E.8.2. Calculation of project GHG emissions or actual net anthropogenic GHG removals by sinks

Means of verification	Document Review, Interview
Findings	-
Conclusion	There are no project emissions identified in the monitoring methodology /B02/ or the PDD /B05/.

E.8.3. Calculation of leakage GHG emissions

Means of verification	Document Review, Interview
Findings	-
Conclusion	The leakage correction factor has been accounted for in the equation above biomass savings ($B_{y,savings}$). This is in accordance with the methodology AMS-II.G, version 01 /B02/.

E.8.4. Summary calculation of GHG emission reductions or net anthropogenic GHG removals by sinks

Means of verification	Document Review, Interview
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Findings	-
Conclusion	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 PDD /B05/. The total number of ERs achieved during the monitoring period is 12,685 tCO ₂ e.

E.8.5. Comparison of actual GHG emission reductions or net anthropogenic GHG removals by sinks with estimates in registered PDD

Means of verification	Document Review, Interview
Findings	-
Conclusion	<p>The verification team has compared the actual ERs achieved during this monitoring period with the estimated value for the monitoring period.</p> <p>The ex-ante estimate value of the emission reductions for the monitoring period as per the registered PDD /B05/ is 34,027 tCO₂e and the actual emission reductions achieved for the monitoring period is 12,685 tCO₂e. The actual emission reductions are lower than the estimate of the registered PDD /B05/ for the current monitoring period.</p> <p>The verification team took cognizance of §375 of CDM VVS for project activities, version 01 /B01-1/.</p>

E.8.6. Remarks on difference from estimated value in registered PDD

Means of verification	Document Review, Interview
Findings	-
Conclusion	Emission reductions achieved during the current monitoring period are lower than the estimated value in the registered PDD for the corresponding period for which the monitoring has been reported and emission reductions are being claimed (01/07/2016 to 30/06/2017).

E.8.7. Actual GHG emission reductions or net anthropogenic GHG removals by sinks during the first commitment period and the period from 1 January 2013 onwards

Means of verification	Document Review, Interview
Findings	-
Conclusion	<p>CERs achieved up to 31st December 2012 – 0 t CO₂e</p> <p>CERs achieved from 1st January 2013 – 12,685 tCO₂e</p>

E.9. Assessment of reported sustainable development co-benefits

Means of verification	Not applicable
Findings	-
Conclusion	Not applicable

E.10. Global stakeholder consultation

Means of verification	Not applicable (this is not first MP)
Findings	-
Conclusion	Not applicable (this is not first MP)

SECTION F. Internal quality control

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

SECTION G. Verification opinion

>>

Carbon Check (India) Private Ltd. (CCIPL) has performed the seventh periodic verification of the registered CDM Project Activity “Efficient Fuel Wood Stoves for Nigeria” having UNFCCC reference number 2711.

The verification team assigned by the DOE concludes that the project activity as described in the registered PDD (revised) (version 03 dated 18/02/2013) /B05/ and the monitoring report (version 03 dated 12/01/2018) /02/, meets all the relevant requirements of the UNFCCC for CDM project activities including article 12 of the Kyoto Protocol and paragraph 62 of CDM Modalities & Procedures, the modalities and procedures for CDM Executive Board (Marrakesh Accords) and subsequent decisions by the COP/MOP and CDM Executive Board. The verification has been conducted in-line with the CDM VVS for project activities, version 01.0 requirements /B01-1/.

Verification methodology and process

The verification team confirms the contractual relationship signed on 04/05/2017 between the DOE, CCIPL and the Project Participant (atmosfair gGmbH). The team assigned to the verification meets the CCIPL’s internal procedures including the UNFCCC requirements for the team composition and competence. The verification team has conducted a thorough review as per UNFCCC and CCIPL’s procedures and requirements.

The verification has been performed as per the requirements described in the CDM VVS for project activities, version 01.0/B01-1/ and constitutes the review and completion of the following steps:

1. Reviewing the registered PDD (version 2.1, dated 12/10/2009) and the revised PDD (version 03 dated 18/02/2013) /B05/, including the monitoring plan and the corresponding validation report /B05/;
2. On-site assessment (24/07/2017 to 01/08/2017)
3. Publication of the MR (version 01 dated 03/11/2017) /01/ on the UNFCCC website /B07-1/ on 09/11/2017);
4. Desk review of the validation report /B05/, MR /01/ and other relevant documents including documents related to the projects activities in emission reductions;
5. Review of the applied monitoring methodology (AMS-II.G version 1) /B02/;
6. Review of any CMP and EB decisions, clarifications and guidance;
7. Resolution of CARs and CLs raised during verification
8. Issuance of Verification Report

The project activity was correctly implemented according to the selected monitoring methodology, monitoring plan and registered PDD /B05/. The monitoring system was installed, maintained in a proper manner, while collected monitoring data allowed for the verification of the amount of achieved GHG emission reductions. Through the review an on-site visit the verification team confirms that the project activity has resulted in 12,685 tCO₂e emission reductions during the seventh monitoring period.

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)	0	12,685

CC IPL is therefore pleased to issue a positive verification opinion expressed in the attached Certification statement.

SECTION H. Certification statement

>>

Carbon Check (India) Private Ltd., the DOE, has performed the verification of the registered project activity “Efficient Fuel Wood Stoves for Nigeria” having UNFCCC Registration Number 2711. The project activity is designed to generate emission reductions by distribution of the fuel-efficient cook stoves in Nigeria.

The project participants are responsible for the collection of data in accordance with the monitoring plan and the reporting of GHG emissions reductions from the project. It is DOE’s responsibility to express an independent verification statement on the reported GHG emission reductions from the project. The DOE does not express any opinion on the selected baseline scenario or on the validated and registered PDD. The verification is carried out in-line with the CDM VVS for project activities requirements.

The verification was performed to identify the compliance of the project activity with the implementation and the 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:

- PDD version 2.1 and the corresponding validation report registered with the CDM Executive Board on 12/10/2009 and its monitoring plan /B05-1/;
- Approved revised PDD version 3, date 18/02/2013 and the corresponding validation opinion; approved by EB on 08/11/2013 /B05-2/
- Approved monitoring methodology AMS-II.G “Energy Efficiency Measures in Thermal Applications of Non-Renewable Biomass”, version 01 /B02/;
- Previous verification reports for the project activity /B07-3/;
- Monitoring report(s) version(s) 01; 02 and 03, dated 03/11/2017; 01/12/2017 and 12/01/2018 respectively.

This statement covers verification period from 01/07/2016 to 30/06/2017 (inclusive of both days).

The DOE had raised 02 clarification requests which have been successfully resolved by the PP.

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

The DOE, hereby certifies that the project activity, achieved emission reductions by sources of GHG equal to 12,685 tCO₂e 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 reductions from 01/07/2016 to 30/06/2017 as verified during the course of the verification are as below:


Item	Emission reductions up to	Emission reductions from
------	---------------------------	--------------------------

	31 December 2012	1 January 2013 onwards
Emission reductions (t CO ₂ e)	0	12,685

Appendix 1. Abbreviations

Abbreviations	Full texts
BE	Baseline Emissions
CER	Certified Emission Reduction
CAR	Corrective Action Request
CC IPL	Carbon Check (India) Private Ltd.
CDM	Clean Development Mechanism
CL	Clarification Request
CO ₂	Carbon Dioxide
CO _{2e}	Carbon Dioxide Equivalent
DOE	Designated Operational Entity
DVR	Draft Verification Report
EB	CDM Executive Board
EF	Emission Factor
FAR	Forward Action Request
GHG	Greenhouse gas(es)
GWh	Giga Watt Hour
GWP	Global Warming Potential
IPCC	Intergovernmental Panel on Climate Change
LE	Leakage Emissions
MP	Monitoring Period
MR	Monitoring Report
MWh	Mega Watt Hour
OSV	On Site Visit
PE	Project Emissions
PP(s)	Project Participant(s)
PRC	Post registration change
QA/QC	Quality Assurance / Quality Control
TA	Technical Area
TR	Technical Review
UNFCCC	United Nations Framework Convention on Climate Change
VVS	Validation and Verification Standard

Appendix 2. Competence of team members and technical reviewers



Carbon Check (India) Private Ltd.

Sanjay Agarwalla

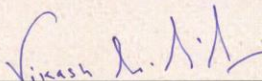
has been qualified as per CCIPL's internal qualification procedures, in accordance with requirements of Accreditation Standard (version 06.0):

For following functions:

Validator Team Leader Technical reviewer
 Verifier Technical Expert Local Expert¹

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
Compliance Officer



Mr. Amit Anand
CEO

Date of Approval
24/12/2017

Valid Till
23/12/2018

Revision History of the Document

26/12/2014	Initial Adoption
24/12/2015	Annual Revision
20/01/2016	Interim Revision for office address change
23/12/2017	Annual Revision
24/12/2017	Annual Revision

¹India

CARBON CHECK (INDIA) PRIVATE LIMITED
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 Regd. Off: 2071/38, 2nd Floor, Naiwala, Karol Bagh, New Delhi - 110005
 Corporate off: G 49 & 50, 3rd Floor, Sector - 3, NOIDA (Uttar Pradesh) - 201301
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Carbon Check (India) Private Ltd.

Kranav Sharma

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 Expert¹

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
 Compliance Officer


 Mr. Amit Anand
 CEO

Date of Approval
 24/12/2017

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|------------|--|
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 e-mail: info@carboncheck.co.in



Carbon Check (India) Private Ltd.

Amit Anand

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

For following functions:

- Validator Team Leader Technical reviewer
 Verifier Technical Expert Local Expert¹

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
Compliance Officer

Date of Approval
24/12/2017

Valid Till
23/12/2018

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¹India, South Africa

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Appendix 3. Documents reviewed or referenced

No.	Author	Title	References to the document	Provider
1	atmosfair gGmbH	1. Published Monitoring Report 2. Monitoring Report	Version 01, 03/11/2017 Version 02, 01/12/2017	PP
2	atmosfair gGmbH	Final monitoring report	Version 03, 12/01/2018	PP
3	atmosfair gGmbH	Emission reduction spreadsheet corresponding to /1/	Version 01, 03/11/2017	PP
4	atmosfair gGmbH	Emission reduction spreadsheet corresponding to /2/	Version 03, 12/01/2018	PP
5	atmosfair gGmbH	Sample Carbon Credit waiver forms/ Sales receipts for the stoves	--	PP
6	atmosfair gGmbH	Water Boiling test records	--	PP
7	atmosfair gGmbH	Water boiling test equipment manuals / calibration certificates: 1. Weighing Scale 2. Thermocouple	--	PP
8	atmosfair gGmbH	Spot Check user records	--	PP
9	atmosfair gGmbH	Project Database and random generator	--	PP
10	atmosfair gGmbH	Technical specification of the stoves distributed (SAVE80 Factsheet)	--	PP
11	atmosfair gGmbH	Training records	--	PP
12	atmosfair gGmbH	CDM Manual	--	PP
13	atmosfair gGmbH	Clarification letter from UNFCCC (INQ-04074-EB) dated 30/11/2015	INQ-04074-EB	PP
/B01/	UNFCCC	1. CDM validation and verification standard for project activities, version 01.0 2. CDM project standard for project activities, version 01.0 CDM project cycle procedure for project activities, version 01.0	-	Other
/B02/	UNFCCC	Applied baseline and monitoring methodology, AMS-II.G, version 01	-	Other
/B03/	UNFCCC	Monitoring report form and guidelines, version 06.0	-	Other
/B04/	UNFCCC	Guideline on the application of Materiality in verifications, version 02	-	Other
/B05/	UNFCCC	CDM Project documents: 1. Registered PDD (version 2.1 and dated 08/06/2009) and corresponding validation report. 2. Revised PDD (version 3 and dated 18/02/2013) and corresponding validation opinion	-	Other

		on the change in project design and monitoring plan 3. Monitoring reports and corresponding verification reports of previous verifications available on the UNFCCC website.		
/B06/	UNFCCC	Standard: Sampling and surveys for CDM project activities and programme of activities, version 07	-	Other
/B07/	UNFCCC	Weblinks: 1. http://cdm.unfccc.int/ 2. FAO, 2003 report (Project View page)	-	Other

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

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

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

Table 2. CL from this verification

CL ID	CL 01	Section no.	E.6.2	Date: 09/11/2017
Description of CL				
PP needs to clarify the increase in monitored average stove efficiency value in the current monitoring period as compared to MP 5 (from 35.81% to 38.73%). Also, it is noted that the samples for which WBT was conducted, do not match with the random number generator. PP is requested to submit all the scanned copies of the WBT records and survey records.				
CME response				Date: 01/12/2017
Save80 is an industrial product made of stainless steel, hence there is no decrease in efficiency due to material deterioration to be expected. Therefore, variations in efficiency are due to testing conditions and are within normal range of standard deviation in this MP. Since tests are done at the households and the kitchen places are often located outside, weather conditions such as wind can have an influence. There is also a copy paste error for the WBT stove IDs tested and corresponding data. This has been corrected and submitted to DOE.				
Documentation provided by the CME				
WBT records Revised MR and ER calculation				
DOE assessment				Date: 19/12/2017
The explanation provided by the PP is deemed acceptable. The verification team has observed that there was an increase in the efficiency value from the previous monitoring periods. The verification team deemed it to be acceptable owing to the following factors:				
<ol style="list-style-type: none"> 1. The verification team assessed the data / information flows for parameter η_{new} and found no gaps between the sampling procedure in the registered monitoring plan and its implementation. 2. The verification team accepts that a variation in results (i.e. increase or decrease in parameter values) is possible due to randomness of samples. 3. The design efficiency of the SAVE 80 stoves is 52 % which is much higher than the monitored value. Considering the above, the verification team deemed acceptable the monitored values of the stove efficiencies for the current monitoring period. 				
Furthermore, the corrected efficiency value for vintage 1 is now 39.20% (36.97% after multiplication with conservativeness factor of 0.943 as per the registered PDD). This has resulted in increase in ERs from 12,663 to 12,685 tCO _{2e} .				
PP has provided all the WBT records to the verification team which have been verified and found to be consistent with the ER spread sheet.				

CL ID	CL 02	Section no.	E.6.2	Date: 09/11/2017
Description of CL				
On page 14 of the published MR for " $\eta_{new,1}$ ", value for "n" is stated as 9 whereas it is noted that only three stoves were tested (with 3 tests for each stove). Clarification is requested.				
PP response				Date: 01/12/2017

<p>3 stoves from 1st vintage were tested as per the PDD requirements, and each stove was tested three times. Therefore, the total number of tests are 9. All 9 test results are used to get the mean value for the efficiency. This mean value is then used for the 1st vintage stoves (i.e. all stoves from project start date to end of first monitoring period), whereas the mean value results for the other stove vintages are taken from the former monitoring periods in the respective order. All mean values obtained from the efficiency testing in the monitoring periods are further multiplied with conservativeness factor 0.943, hence there is an additional discount on stove efficiency of 5.7%. Same is further clarified in the Monitoring Report, revised version.</p>	
Documentation provided by the PP	
Revised MR	
DOE assessment	Date: 19/12/2017
Three stoves were subjected to WBT each three times (so in total 9 WBTs were conducted for the monitoring period). This has been further clarified in the revised PDD. Hence the CL is closed.	

Table 3. CAR from this verification

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

Table 4. FAR from this verification

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

Appendix 5. Data and parameters fixed ex ante

Data/Parameter	$B_{\text{appliance}}$ - Quantity of Biomass used in the absence of the project activity (per appliance)
Default values used:	4.6534
Purpose of data	Calculation of baseline emissions
Source and Verification of the source	Baseline survey. The value has been determined in the PDD/B05/ through household baseline surveys.

Data/Parameter	L_y - Leakage Correction Factor
Default values used:	0.99
Purpose of data	Calculation of baseline emissions
Source and Verification of the source	Derived from leakage assessment. The value has been assessed in the PDD /B05/.

Data/Parameter	η_{old} - Efficiency of the system being replaced
Default values used:	0.1
Purpose of data	Calculation of baseline emissions
Source and Verification of the source	The value has been determined through water boiling test experiments. The value has been assessed in the PDD /B05/.

Data/Parameter	$f_{\text{NRB}, y}$ - Fraction of non-renewable biomass saved by the project activity
Default values used:	0.77
Purpose of data	Calculation of baseline emissions
Source and Verification of the source	The value has been taken from FAO (2003) report /B07-2/. The value has been assessed in the PDD /B05/.

Data/Parameter	$\text{NCV}_{\text{biomass}}$ - Net calorific value of non-renewable biomass that is substituted
Default values used:	0.015 TJ/tonne
Purpose of data	Calculation of baseline emissions
Source and Verification of the source	IPCC default value. The value is default IPCC value as provided in the methodology /B02/.

Data/Parameter	$\text{EF}_{\text{projected fossil fuel}}$ - Emission factor for the substitution of non-renewable biomass by similar consumers
Default values used:	71.5 tCO ₂ /TJ
Purpose of data	Calculation of baseline emissions
Source and Verification of the source	IPCC default value. The value has been determined based on the default IPCC value for kerosene and the household survey conducted.

Appendix 6. Data and parameters monitored

Monitoring Parameter Requirement	Assessment/ Observation by the DOE
Data / Parameter: (as in monitoring plan of PDD):	Number of SAVE80 systems in use per vintage ($N_{y,i}$)
Measuring frequency/Time Interval:	Continuous recording
Reporting frequency:	Spot Checks: Annually
Reported value:	4612.85
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
Details of monitoring equipment:	The data is recorded in the electronic database
Is accuracy of the monitoring equipment as stated in the PDD? If the PDD does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practise?	NA
Calibration frequency /interval: Is it monitoring methodology /CDM EB guidance / local or national standards / manufacturers specification	The QA/QC procedures have been undertaken in accordance with the registered PDD /B05/.
Is the calibration interval in line with the monitoring plan of the PDD? If the PDD does not specify the frequency of calibration, does the selected frequency represent good monitoring practise?	The QA/QC procedures have been undertaken in accordance with the registered PDD /B05/.
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 reported data has been cross-checked against spot check user records/08/ and compared with the MR /02/ and the ER sheet /04/.
How were the values in the monitoring report verified?	The reported data has been cross-checked against spot check user records/08/ and compared with the MR /02/ and the ER sheet /04/. The data was then verified against the sample households checked during the site visit.
Does the data management (from data generation to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes
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. Full data is available for the monitoring period.

Monitoring Parameter Requirement	Assessment/ Observation by the DOE
Data / Parameter: (as in monitoring plan of PDD):	$t_{y,j}$ – Operation time per SAVE80 system per vintage (months of the Monitoring Period/months per year).
Measuring frequency/Time Interval:	The measuring and reporting frequency is consistent with the registered PDD /B05-1,2/ and the previous monitoring reports /B05-3/.

Reporting frequency:	The measuring and reporting frequency is consistent with the registered PDD and the previous monitoring reports.
Reported value:	$t_{y,j} = 1$ for all deployed systems in vintage 1-8
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	The measuring and reporting frequency is consistent with the registered PDD and the previous monitoring reports.
Details of monitoring equipment:	NA
Is accuracy of the monitoring equipment as stated in the PDD? If the PDD does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practise?	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 PDD? If the PDD does not specify the frequency of calibration, does the selected frequency represent good monitoring practise?	NA
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 ER sheet /02/ and the MR /04/. The values provided are consistent.
How were the values in the monitoring report verified?	The project monitoring database /09/ was checked to confirm the values.
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
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. The data has been monitored in accordance with the registered monitoring plan.

Monitoring Parameter Requirement	Assessment/ Observation by the DOE
Data / Parameter: (as in monitoring plan of PDD):	$\eta_{new,t}$ Efficiency of the SAVE80 system for each vintage
Measuring frequency/Time Interval:	Annually
Reporting frequency:	Annually
Reported value:	36.08% (weighted average for MP7)
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
Details of monitoring equipment:	KD 8000 Weighing scale /07-1/ GMH 3710 Thermocouple /07-2/
Is accuracy of the monitoring equipment as stated in the PDD? If the PDD does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practise?	NA. The accuracy of weighing scale is 0.001 kg /07-1/ and of the thermocouple is +/-0.03°C /07-2/
Calibration frequency /interval:	The calibration certificates for thermocouple is valid for the

Is it monitoring methodology /CDM EB guidance / local or national standards / manufacturers specification	period when the monitoring was done /07-2/. As per the manufacturer specification, the weighing scale does not require recalibration /07-2/.
Is the calibration interval in line with the monitoring plan of the PDD? If the PDD does not specify the frequency of calibration, does the selected frequency represent good monitoring practise?	NA
Company performing the calibration(internal or external calibration):	Ecolab Nig. Ltd.
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	Yes, the calibration confirms proper functioning of monitoring equipment.
Is (are) calibration(s) valid for the whole reporting period?	Yes, the calibration confirms proper functioning of monitoring equipment.
If applicable, has the reported data been cross-checked with other available data?	The reported data has been cross-checked with the WBT test records, ER sheet and MR.
How were the values in the monitoring report verified?	The value for the reported data was verified against the WBT test records.
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
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. The data has been monitored in accordance with the registered monitoring plan.

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Document information

<i>Version</i>	<i>Date</i>	<i>Description</i>
02.1	11 January 2018	Editorial revision to correct the numbering of appendices in the instructions.
02.0	31 October 2017	Revision to align with the requirements of the “CDM validation and verification standard for project activities” (version 01.0).
01.0	23 March 2015	Initial publication.

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