

Verification and Certification Report

of

Improved Cooking Stoves for Nigeria
Programme of Activities

CPA# 1 Improved Cooking Stoves for Nigeria

GLC Report No: 293, Rev. 06

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Organisational Unit Germanischer Lloyd Certification GmbH (GLC), Greenhouse Gas Services		
Client Atmosfair gGmbH	Client reference person Xaver Kitzinger	
Summary:		
UNFCCC Ref.	5067	
Title of PoA:	Improved Cooking Stoves for Nigeria Programme of Activities	
Title of included CPAs:	CPA# 1 Improved Cooking Stoves for Nigeria	
Project Country:	Nigeria	
Sectoral Scope, Technical Area	CDM Sectoral Scope 3, Technical Area 3.1	
Methodology(ies) / Version(s):	AMS-II.G version 03	
Project Size:	☐ Large Scale	☒ Small Scale
Number of verification:	1 st	
Dates of monitoring period (incl. both days)	2011-11-10 to 2012-06-30	
Verified emission reductions	2,376 t CO ₂	
Included post registration changes	☐ yes ☒ no	
Project Assessment Team:	Technical Review Team:	Approval by:
Karunakar Avuram Johnbosco Ihemedu	Jose-Emilio Moreno Markus Weber	Markus Weber
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02	2013-02-11	Jose-Emilio Moreno	Reviewer / Technical Expert	Review with comments
03	2013-02-19	Karunakar Avuram	Assessment team leader	Addressing review comments
04	2013-02-24	Jose-Emilio Moreno	Reviewer / Technical Expert	Review with comments
05	2013-03-07	Karunakar Avuram	Assessment team leader	Addressing review comments and preparation of final report
06	2013-03-13	Markus Weber	Final Reviewer / Approver	Final Review and approved

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Abbreviations

CAR	Corrective Action Request
CDM	Clean Development Mechanism
CDM-EB	CDM Executive Board (the board)
CER	Certified Emission Reduction
CL	Clarification request
CMP	Meeting of the Parties to the Kyoto Protocol
CO ₂	Carbon dioxide
CO ₂ e	Carbon dioxide equivalent
COP/MOP	The Conference of the Parties to the United Nations Framework Convention on Climate Change serving as the Meeting of the Parties to the Kyoto Protocol
CPA	Component Project Activity
CPA-DD	CPA- Design Document
DARE	Developmental Association for Renewable Energies
DNA	Designated National Authority
DOE	Designated Operation Entity
ER	Emission Reduction
FAR	Forward Action Request
GHG	Greenhouse gas(es)
GLC	Germanischer Lloyd Certification GmbH
ICS	Improved Cooking Stove
MP	Monitoring Plan
MR	Monitoring Report
PP	Project Participant
PoA	Program of Activities
PoA-DD	PoA- Design Document
QA/QC	Quality Assurance / Quality Control
UNFCCC	United Nations Framework Convention on Climate Change
VVS	Validation and Verification Standard

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1 INTRODUCTION

Atmosfair gGmbH¹ has commissioned the Germanischer Lloyd Certification GmbH (GLC) to carry out the 1st verification of the CDM PoA “Improved Cooking Stoves for Nigeria Programme of Activities” with regard to the relevant requirements for CDM programme of activities. The PoA was registered by the UNFCCC on [2011-11-10](#) as CDM PoA with reference number 5067. The verification covers the period from 2011-11-10 to 2012-06-30. It is to be noted that by the end of the 1st monitoring period, there was only one CPA “CPA #1 Improved cooking stoves for Nigeria” included in the PoA. Therefore, the emission reduction verified during the verification corresponds to the emission reduction from the implementation of the 1st CPA “CPA #1 Improved cooking stoves for Nigeria”. The verifiers have reviewed the implementation of the monitoring plan (MP) as described in the registered CPA-DD ^{/4/} and the corresponding PoA-DD^{/2/} and the Monitoring Report ^{/7/}, version 02.1, dated 2013-01-16.

GHG data for the monitoring period was verified in detailed manner applying the set of requirements, audit practices and principles as required under the Validation and Verification Standard ^{/1/} of the UNFCCC. This report summarizes the findings and conclusions of the 1st verification of the above mentioned PoA.

1.1 Objective

The objective of the verification is the review and ex-post determination by an independent entity of the GHG emission reductions. It includes the verification

- that the included CPAs have been implemented and operated as per the registered PoA-DD^{/2/} and the corresponding CPA-DDs^{/4/} and that all physical features (technology, project equipment, and monitoring and metering equipment) of the CPA are in place;
- that the monitoring report and other supporting documents provided are complete and verifiable and in accordance with applicable CDM requirements;
- that actual monitoring systems and procedures comply with the monitoring systems and procedures described in the monitoring plans and the approved methodology;
- that the data is recorded and stored as per the monitoring methodology.

1.2 Scope

The verification of this registered project is based on the registered PoA-DD ^{/2/}, the validated / included CPA-DD^{/4/}, the monitoring report ^{/7/}, emission reduction calculation spread sheet ^{/14/}, supporting documents made available to the verifier and information collected through performing interviews and during the on-site assessment. Furthermore publicly available information was considered as far as available and required.

The verification is carried out on the basis of the following requirements, applicable for the PoA and the corresponding CPA:

¹ It is to be noted that “Atmosfair gGmbH”, “atmosfair gGmbH”, “Atmosfair” and “atmosfair” represent the same entity

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- Article 12 of the Kyoto Protocol ^{/11/},
- guidelines for the implementation of Article 12 of the Kyoto Protocol as presented in the Marrakech Accords under decision 3/CMP.1 ^{/12/} and subsequent decisions made by the Executive Board and COP/MOP,
- other relevant rules, including the host country legislation,
- CDM Validation and Verification Standard ^{/1/},
- PoA Standard^{/15/}
- monitoring plan as given in the registered PoA-DD^{/2/} and CPA-DD ^{/4/},
- Approved CDM Methodology "AMS II.G", version 03 - Energy efficiency measures in thermal applications of non-renewable biomass ^{/8/}.

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2 VERIFICATION TEAM

2.1 Assessment Team

A competent team with relevant knowledge and experience in the specific sectoral scopes and knowledge in PoA/CPA was appointed by GLC. Furthermore the appointment of the team takes into account the required knowledge of the host country and general project knowledge requirements for verifying the PoA design and the achieved CERs. The assessment team can be composed of an Assessment Team Leader (ATL), auditors (A) and host country or technical expert (E). Table 1 below shows the composition of the assessment team, the qualification of the team members and their functions.

Table 1: Verification team

Name	Function ¹⁾	Sectoral scope specific knowledge	Technical area specific knowledge	Local knowledge	Type of involvement				
					Desk review	On-site visit / interviews	Reporting	Supervision of work	Expert input
Avuram, Karunakar	ATL/TE	X	X		X	X	X	X	X
Johnbosco Ihemedu	LE			X	X	X			X

A Auditor
ATL Assessment team leader

FE Financial expert
LE Local expert

T-ATL Trainee ATL
T-A Trainee auditor
TE Technical expert

2.2 Technical Review Team and Approval

Before submission of the final verification report to the CDM EB of the UNFCCC, a technical review of the whole verification and the draft report was carried out by an appointed technical review (TR) team. The TR team is composed of persons competent to the technical area the PoA falls under. Each person involved in the reviewer is independent to the verification assessment.

The complete assessment prepared by the verification team is checked, if required adjusted and finally confirmed by the TR process.

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The TR team and the person responsible for approval of the report are found in the table below:

Table 2: Technical review team and approval

Name	Function ²⁾	Technical area specific knowledge	Sectoral scope specific knowledge	Supervision of work
Jose-Emilio Moreno	R/TE	X	X	X
Markus Weber	FR/AP			X

AP Approver
FR Final reviewer

TE Technical expert
T-R Trainee reviewer
R Reviewer

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3 METHODOLOGY

3.1 Verification Process

The verification process is based on the guidelines described in the Validation and Verification Standard^{/1/}. In addition to that standard auditing techniques have been applied. The verification team performs first a desk review, followed by an on-site visit to review the project realisation. The findings are collected and described in a questionnaire. In case of lack of clarity or inconsistencies related findings will be raised. The next step is to close out the findings through direct communication with the PPs and finally prepare the final verification report. This verification report and other supporting documents then undergo a technical review by the "GLC GmbH" prior to the submission to the CDM-EB.

3.2 Desk review

From 2012-11-05 to 2012-11-22, GLC has conducted a desk review of all documents initially provided by the client and publicly available documents relevant for the verification. The main reviewed documents are listed below:

- The registered PoA-DD^{/2/} and the corresponding validation report ^{/5/};
- The registered or included CPA-DD^{/4/}, including the monitoring plan and the corresponding validation report;
- The applied monitoring methodology^{/8/};
- The monitoring report ^{/6/} and the corresponding emission reduction calculations ^{/14/}.
- Relevant decisions, clarifications, guidance and standards from the CMP and the CDM Executive Board;
- Any other information and references relevant to the CPA's resulting emission reductions (e.g., IPCC reports etc.).

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3.3 On-site assessment

From 2012-11-26 to 2012-11-30, Mr Karunakar Avuram and Mr. Johnbosco Ihemedu of GLC's verification team carried out an on-site visit.

The main tasks covered during the on-site visit include, but are not limited to:

- Verifying whether the PoA implementation is inline with the description in the registered PoA-DD^{/2/}
- Verifying whether the CPA was implemented as described in the registered PoA-DD^{/2/} and the CPA-DD^{/4/} and is in operation as anticipated
- Verifying CME database^{/23/}
- Physical inspection to the end users of cook stoves in order to verify the monitoring information presented in the monitoring report^{/6/}
- The operating staff was interviewed and observed in order to check the risks of inappropriate operation and data collection procedures
- Checking competences of CME, CME quality manual and procedures^{/38/}
- Assessing the competency levels of the operating team to implement and monitor the CPA as described in the registered PoA-DD^{/2/} and CPA-DD^{/4/}
- Information processes for generating, aggregating and reporting the selected monitored parameters were reviewed
- The monitoring processes, routines and documentations were audited to check their proper application
- The monitoring data were checked completely
- The data aggregation trails were checked
- Verifying QA/QC procedures of CME

The main topics of the interviews and interviewed persons are summarized in the Table 3. The main topics of the interviews were:

- General aspects of the project
- Technical equipment and operation
- Changes since validation
- Monitoring and measurement equipment
- Remaining issues from validation
- Quality management system
- Involved personnel and responsibilities
- Training and practice of the operational personnel
- Implementation of the monitoring plan

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- Monitoring data management
- Data uncertainty and residual risks
- GHG calculation
- Procedural aspects of the verification
- Maintenance
- Environmental aspects
- Realized benefits and acceptability of the equipment

Table 3: Interviewed persons

Name	Organization/Function
Maren Kugler	Implementation & controlling +QA/QC, Atmosfair
Dietrich Brockhagen	Database Manager, Atmosfair
Danjuma Tanko	Database officer, DARE
Yahaya Ahmed	Chairman/CEO, DARE
Adeso Paul	Accountant, DARE
Danjuma Abdul Aziz	Distributor (Zaria and Katsina)
Aliyu Safiya	General Assistant, DARE
Lawaz Ayuba	Distributor (Makarti area)
Abdul Razaq	Technician, DARE
Omotayo Akinyede	B.A. Sales Manager, BiA
Armayau Zayyad	Branch Manager, FCMB bank, Katsina

Apart from the above mentioned interviewed persons, 68 users of SAVE80 cook stoves² were visited and interviewed during the onsite assessment. List of interviewed persons along with their signatures and the information collected in the form of questionnaires are available in original with GLC. Scanned copies of the same can be provided upon requirement.

² It is to be noted that the phrases 'SAVE80 cook stove', 'SAVE80 stove', 'SAVE80 system' or 'the improved cook stove' mentioned in this document represent the same i.e. the efficient fuel wood stoves of type SAVE80 deployed under the CPA.

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3.4 Resolution of Findings and Reporting

On the basis of the desk review, the on-site visit, follow-up interviews and further background investigation the verification questionnaire is completed. In case any inconsistencies or lack of clarity were identified during the verification the team has raised a

Corrective Action Requests (CARs), if:

- the project participants have made mistakes that will influence the ability of the CPA to achieve real, measurable additional emission reductions;
- the CDM requirements have not been met;
- there is a risk that emission reductions cannot be monitored or calculated.

Clarification Request (CL), if:

- information is insufficient or not clear enough to determine whether the applicable CDM requirements have been met.

In case the team has identified essential risks for further verifications or the actual status requires a special focus on this item for the next consecutive verification, or an adjustment of the monitoring plan is recommended a Forward Action Request (FAR) was raised.

All CARs, CLs and FARs raised have been sent to the client with the request to address the findings. After the findings have been answered by the client in an appropriate manner, the CARs, CLs and FARs will be closed out.

For a detailed list of all CARs, CLs and FARs raised in the course of the verification please refer to Annex-A.

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4 VERIFICATION REPORTING

4.1 Verification of Compliance

4.1.1 Compliance of the PoA implementation in accordance with the registered PoA-DD

It was verified during the verification that if the PoA implementation is in accordance with the description in the registered PoA-DD^{2/}. The registered PoA “Improved Cooking Stoves for Nigeria Programme of Activities” is a joint initiative by the German NGOs atmosfair gGmbH (atmosfair) and Lernen-Helfen-Leben e.V. (LHL) and the Nigerian Developmental Association for Renewable Energies (DARE) to promote dissemination of improved cooking stoves to households in the Federal Republic of Nigeria. The PoA is coordinated and managed by the CME, atmosfair. DARE is a distributor who supports atmosfair in implementing the PoA. However, DARE is not a project participant. LHL supports atmosfair in managing the PoA and is the liaising organisation between atmosfair and DARE.

The verification covers the period from 2011-11-10 to 2012-06-30. It is to be noted that by the end of the 1st monitoring period, only one CPA “CPA # 1 Improved Cooking Stoves for Nigeria” was included in the PoA. The other two CPAs (according to the UNFCCC web page at the time of preparing the report) were included on [2012-07-11](#). Therefore, the verification was focussed on verifying the implementation of the 1st CPA and the emission reduction achieved thereof. The assessment in subsequent sections is primarily with reference to the 1st CPA “CPA # 1 Improved Cooking Stoves for Nigeria” included in the registered PoA.

4.1.2 Compliance of the CPA implementation in accordance with the CPA-DD included in the Registered PoA

The CPA “CPA # 1 Improved Cooking Stoves for Nigeria” involves the dissemination of efficient fuel wood stoves of the type SAVE80 in households within Nigeria. Based on this on-site verification and the reviewed project documentation, the verification team confirms that the realised technology, the project equipment, as well as the monitoring plan has been implemented and operated as described in the registered CPA-DD^{4/}. By the end of the 1st monitoring period 2,515 appliances have been deployed. Not all SAVE80 cook stoves supplied by the end of the monitoring period have yet been recorded in the project database due to delay in getting the sales receipt from the local distributors (please refer to CL5 in Annex A). The cook stoves sold in a month are accounted for emission reduction calculation from the following month. Therefore, the total number of cook stoves in operation until the end of the monitoring period corresponds to the cook stoves delivered to end user on or before 2012-05-31 since the monitoring period covers the period from 2011-11-10 to 2012-06-30.

The CPA was implemented as part of the registered PoA “Improved Cooking Stoves for Nigeria Programme of Activities” The CPA “CPA # 1 Improved Cooking Stoves for Nigeria” was implemented by Atmosfair (the CME) with the help of DARE and LHL. The improved cook stoves (ICS) disseminated save up to 80% of fuel wood. The ICS disseminated under this CPA save fuel wood and hence reduce greenhouse gas emissions stemming from the use of non-renewable biomass.

The SAVE80 is a portable stove made of stainless steel, developed and prefabricated by a German manufacturer and assembled locally to create employment and income. The initial model has a

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specified thermal efficiency of 52%^{/29/} compared to the baseline stove efficiency of 10% and has nominal effective thermal power of about 1.5 kW. As per specification of the manufacturer, the SAVE80 needs only about 250 g of small brittle sticks of wood to bring 6 litres of water to the boil, 80% less than traditional fire places. The design ensures preheating of the air and a complete combustion with no visible smoke and only small amounts of ash. The SAVE80 system also consists of custom-fit pots, pans and a heat retaining box (called "Wonderbox"), where food can be transferred after reaching the boiling temperature, and where it will continue to simmer until it is well cooked. The Wonderbox also allows considerable energy savings in addition to the savings by the SAVE80. However, the energy savings on account of Wonderbox are not taken into account for calculating emission reductions which results in conservativeness of the Emission Reduction calculations.

In the baseline scenario, households were using a traditional 3-stone fireplace for cooking. Both the 3-stone fireplace and the project stoves utilize non-renewable firewood. The emission reductions are due to a more efficient use of non-renewable biomass in comparison to the baseline situation. However, during the onsite verification, some of the users revealed that they were using kerosene stoves before purchasing SAVE 80. Therefore, a clarification request (please refer to CL1) was raised.

During the site visit it was also found that few of the cookstoves were not in use (Please refer CAR2 and CL3). One user informed that he also used 3-stone cookstove for cooking during the monitoring period. Therefore, CAR1 was raised. Besides, there was a slight difference in number of eaters between monitoring spot check and verification on-site visit. Therefore CL2 is requested. All the CARs and CLs have been appropriately addressed by the PP and therefore closed. Please refer to Annex A for detailed resolution of all the findings. Moreover, different scenarios in baseline and project situations have also been discussed in section E.3 of the PoA-DD. According to the methodology AMS II.G (version 3) a default value of 81.6 tCO₂/TJ, CO₂ emission factor for the substitution of non-renewable woody biomass by similar consumers, has been used to calculate emission reductions. This is a conservative assumption as compared to the emission factor for wood of 112 t CO₂/TJ ^{/10/} (as per 2006 IPCC Guidelines for National Greenhouse Gas Inventories). On the whole it can be confirmed that the project's implementation is in accordance with the registered CPA-DD^{/4/} and the corresponding PoA-DD^{/2/}.

The CPA is located in Federal Republic of Nigeria. The ICS deployed under this CPA are spread all over Nigeria. The location is recorded on the sales receipt. All appliances disseminated under this CPA have a unique serial number which allows to identify the appliance.

Through document review and on site interview GLC is able to confirm that no outstanding events or situations occurred during this monitoring period (from 2011-11-10 to 2012-06-30).

It is worth to be noted that the start date of the CPA was 2011-03-29^{/22/23/} as assessed from the document review and onsite interviews. The start date corresponds to the date on which the first ICS was delivered to user. Nevertheless, as the PoA was registered on 2011-11-10, the crediting period starts from 2011-11-10. It is confirmed that the emission reduction is correctly accounted for the 1st monitoring period from 2011-11-10 to 2012-06-30.

The emission reductions being claimed for the 1st monitoring period from 2011-11-10 to 2012-06-30 are nearly 36% less than the estimated emission reductions in the registered CPA-DD^{/4/}, as given in the table below:

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Table 4: Emissions Reduction claimed in comparison to the estimates as per CPA-DD

Period	As per CPA-DD	Monitoring report
Emission Reduction (tCO ₂ e)	3,705 ³	2,376
% Deviation (+/-)	0	(-) 35.8%

As presented in the table above, the reported emission reductions during the verification period are 35.8% less than the ex-ante estimated amount of annual emission reductions. The actual emission reductions can be accepted by GLC based on the following reasons:

1. The number of fully operational SAVE80 stoves deployed was 1295 (adjusted total number of stoves) which is less than 1600 as anticipated in the CPA-DD.
2. The drop-out during the monitoring period was 11.32% which is higher compared to 5% assumed in the ex-ante calculation.
3. Average number of eaters per appliance was 7.28 due to capping during the monitoring period which is less compared to 8 as in the CPA-DD

Therefore, the achieved emission reduction is deemed appropriate. The reasons were also provided by the PP in the MR although it is not required to explain when the achieved emission reduction is lower as per the Guideline on completing the monitoring report form ^{/16/}.

4.1.3 Compliance of the Monitoring Plan with the Monitoring Methodology Including Applicable Tools

GLC's verification team has reviewed the application of the implemented monitoring plan vis-à-vis the monitoring requirements of the registered PoA-DD ^{/2/} and CPA-DD ^{/4/} along the whole monitoring period from 2011-11-10 to 2012-06-30. Moreover, the application of the monitoring plan during the monitoring period was also assessed by taking into account the applicable monitoring requirements of the monitoring methodology AMS II.G (version 03) ^{/8/}.

Based on this review the verification team confirms that the monitoring plan of the registered CPA-DD^{/4/} is in compliance with the monitoring methodology AMS II.G (version 03) ^{/8/}.

4.1.4 Compliance of Monitoring Activities with the Registered Monitoring Plan

4.1.4.1 Organisational structure

Description of monitoring system has been sufficiently provided in section C of the monitoring report. From the document review and onsite assessment, the GLC's verification confirms that the information

³ In the registered CPA-DD^{/4/}, expected annual emission reductions are 5,780 tCO₂ for 2012. This monitoring period covers 234 days (10-11-2011 to 30-06-2012, both days included) and hence expected emission reductions as applied in ex-ante calculation of the registered CPA-DD are 5,780 tCO₂ * 234 days / 365 days (of a year) = 3,705 tCO₂

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provided in the MR is correct. The 1st CPA “CPA # 1 Improved Cooking Stoves for Nigeria” under the PoA “Improved Cooking Stoves for Nigeria Programme of Activities” was implemented by the CME Atmosfair gGmbH (atmosfair). It was also confirmed during the onsite interviews that the carbon credits as a result of the CPA are owned by atmosfair. Therefore for this CPA, the PP is same as the CME. However, the CPA was implemented with the help of Nigerian Developmental Association for Renewable Energies (DARE) and Lernen-Helfen-Leben e.V. (LHL). DARE located in Nigeria is the major distributor who receives the shipment of SAVE80 material from the SAVE80 manufacture in Germany. In other words, order is placed by the atmosfair to the SAVE80 manufacturer and the manufacturer delivers the SAVE80 material to DARE. DARE has an office and a factory near Kaduna where the material received from the manufacturer is folded to required shape and assembled. The assembled stoves are sold to end users by DARE and some through local distributors. The GLC’s verification team has collected the details of DARE’s employees, free lancers work for assembling stoves and local distributors as part of verifying gold standard sustainability parameters. Therefore, validation team can confirm that a sound organisational structure is in place to carry out the implementation and monitoring activities of the PoA.

4.1.4.2 Data collection, Storage and QA/QC procedures

When a SAVE80 system is sold a “PoA Sales Receipt”^{22/} similar to purchase contract is signed between the user and the DARE’s employee or the distributor (whoever sells the stove). The sales receipts are submitted at the office of DARE. The administrative staff of DARE transfers the data into electronic database in MS-Excel format (called ‘sales records database’)^{23/}. The data in MS-excel format is also copied into memory sticks at the same time as a backup data. The primary data i.e. the sales receipts is also stored in original format at DARE’s office. The original sales receipts are photocopied, sorted out on a group basis (for easy identification and coordination with the local distributors), while the original sales receipts are sorted out on stove ID basis, and stored in separate files. The photo copied sheets also act as back up data. The PoA sales receipt consists of the following information:

- CPA ID
- Name of the user
- Address and Contact number
- Stove ID
- Declaration
- Price and payment mode
- Signature of buyer / user
- Signature and name of distributor
- Date and place of delivery

Scanned or photo copies of the original sales receipts and the electronic database are sent to atmosfair regularly (typically once in three months). The CME checks for consistency of data between the sales receipts and the electronic database and in case of any inconsistency, it either corrects or instructs the monitoring team⁴ in Nigeria to correct the database. The corrected database is further transferred electronically and stored in central database at atmosfair in Germany. Central database is the database

⁴ The staff of DARE who are involved in distribution, data collection and monitoring activities are referred as “monitoring team”

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which CME maintains for all the CPAs included in the PoA. The other monitored data from sampling is also handled in similar way. The monitoring report and the emission reduction calculation sheets are prepared with the help of corrected database available with atmosfair.

Therefore, the PPs have back up of data in both soft format and hard format. It is confirmed that the data collection procedures and the database maintenance are in accordance with the description in the PoA-DD and the CPA-DD.

The monitoring team has also conducted a sample survey after the end of the monitoring period as per the instructions from the CME. The CME has followed appropriate sampling methodology as required by the monitoring plan of CPA-DD and PoA-DD to determine the sample size. All the required information for the monitoring parameters was collected in the form of questionnaires. The monitoring team was interviewed by the GLC's verification team during onsite verification. The verification team confirms that the monitoring team has received training internally and also from external agencies^{/35/36/37} and the team is competent enough to follow all the required monitoring procedures. Besides, an operating manual^{/38/} and user manual on database^{/30/} were also developed by the CME which contain all the instructions for monitoring and storing of data. The verification team is of the opinion that a robust monitoring system is in place with the CME to monitor the CPA under verification and the overall PoA.

It is therefore confirmed that the data management ensures correct transfer of data and reporting of emission reduction and it is also confirmed that all the required QA/QC procedures are in place.

4.1.4.3 Sampling approach

The monitoring period for the 1st verification is from 2011-11-10 to 2012-06-30. The project participants (PP) have followed sampling approach for monitoring of 'Average number of eaters per appliance ($N_{\text{eaters, appliance}}$)', 'Statistically adjusted drop out from total population of appliances in period y (DO_y)' and 'Adjusted average efficiency of the system being deployed (η_{new})'. Simple random sampling approach was followed by the PP to determine the sample size. A single sample was drawn by the PP from the sales records database inline with the Sampling guidelines of EB 67, Annex 6 ^{/21/}. The required sample sizes were calculated prior to conducting the sample survey using the equations for simple random sampling as per EB 67 Annex 6 (Para 16 to 26) for the proportional parameter of interest (DO_y) and Para 51 to 57 for the mean value parameters of interest ($N_{\text{eaters, appliance}}$; η_{new}). However, the required sample size varied since the confidence/precision of the parameter depends on the variation of the obtained values.

It is worth to be noted that PP drew the sample for carrying out monitoring activity after the end of the monitoring period i.e. during July – August 2012. Therefore, the latest guidelines available by that time (EB 65 Annex 2 and EB 67 Annex 6)^{/20/21/} were applied in calculating the sample size. The approach is inline with the monitoring plan of the CPA-DD which states, "Other sampling methods which may be more practical and cost effective may alternatively be used, while considering the most recent General Guidelines for sampling and surveys for small-scale CDM project activities (http://cdm.unfccc.int/Reference/Guidclarif/ssc/methSSC_guid20.pdf)." However, by the time of preparing the monitoring report the latest version of sampling guidelines were released during EB 69 meeting. Therefore, PP has crosschecked the achieved precision from the results of sample survey in accordance with the latest sampling standard (EB 69, Annex4)^{/33/} and sampling guidelines (EB69, Annex 5)^{/34/}.

Relative precision was calculated at a required confidence interval of 90% (since the duration of monitoring period is less than one year) using the formulae provided in Para 48 and Para 246 of EB 69,

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Annex 5^{/34/} for the parameter DO_y . The PP could achieve a precision of 8% which is less than the requirement of 10%. Similarly, for parameters, $N_{\text{eaters, appliance}}$ and η_{new} , the precision was calculated according to the formulae provided in Para 83 and Para 228 – 230 of EB 69, Annex 5^{/34/}. The PP could achieve a precision of 4% for $N_{\text{eaters, appliance}}$ and 2% for η_{new} . The PP could achieve the mentioned precision with a sample size of 46 for $N_{\text{eaters, appliance}}$, 53 for DO_y and 19 for η_{new} . Since it was a single sample drawn for all the parameters, the PP has in total conducted monitoring spot check to 53 users^{/39/41/}. The PP has recorded monitoring information in a questionnaire. All the 53 spot check documents were provided to the verification team. The questionnaire was signed by the user and the monitoring team member who collected the information.

Upon reviewing the EB documents and checking the monitored data and calculations, the verification team confirms that the sampling approach followed by the PP for monitoring of the parameters meets the requirements of the monitoring plan.

For onsite verification, the GLC's verification team initially opted for an acceptance sampling based on the guidelines provided in Annex 5 of EB 69 report. Given that the PP's monitoring sample consisted of only 53 users, the sample size was calculated to be 46 assuming an acceptance quality level of 0.5% and unacceptable quality level of 10% for an acceptance number of 1 in line with Para 296 of EB 69, Annex 5. Therefore, in order to achieve a fair judgment, the verification team has randomly selected 46 users from the PP's monitoring list before going to the site visit. It was also planned through DOEs professional judgment, that in case the 46 users could not be visited because of safety issues⁵ a smaller sample of 22 could be accepted with an acceptable quality level of 0.5% and unacceptable quality level of 20% and an acceptance number of 1, if the smaller sample is complemented by a cross-check sample of other randomly selected users in safer areas which were not part of the PP sample to judge the appropriateness and conservativeness of PP's monitoring information. Since the geographic area for the CPA has been defined as whole Nigeria, the SAVE80 systems were deployed across different states of Nigeria but predominantly in northern part of Nigeria (49% in Katsina, 21% in Kano and 9% in Kaduna states).

Overall, the verification team visited 68 households (more than PP's monitoring sample size), among 22 from the PP's monitoring sample during the verification site visit⁶ and interviewed the users in the three states Kano, Kaduna and Katsina where most of the stoves are distributed.

The interview sheets with the user signatures are available with GLC and they can be provided on demand.

Though the verification sampling approach was deviated from the initial plan, sufficient number of households were visited and interviewed by the verification team to provide reasonable level of assurance on appropriateness and conservativeness of PP's monitoring. Out of 68 users visited, 22 were from the PP's sample. When the results of PP's sample were verified with the verification results, only one record was found to be deviating. The verification team has again applied the sampling guidelines to check if the PP's monitoring data can be accepted. As per the guidelines, with an

⁵ Security warnings were issued by the embassies in Nigeria (see e.g. US State Department, http://travel.state.gov/travel/cis_pa_tw/tw_5739.html) about safety issues in northern part of Nigeria

⁶ During the on site visit it was realised that the security in northern part of Nigeria was tightened due to repeated communal violence and foreign personnel were not allowed to visit some of the areas. The police have even detained the verification team travelling to Jos in Kaduna state for one hour and warned not to travel in that area. It was not possible to visit all of the initially selected 46 users.

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acceptable quality level of 0.5% and unacceptable quality level of 20%, acceptance number has been determined to be 1 for a verification sample size of 22. Therefore, the verification team is of the opinion that the PP's monitoring data can be accepted. Even when the verification results of remaining 46 users (that were not part of the monitoring sample) analysed and compared with the PP's monitoring results, the PP's monitoring results were found to be conservative compared to onsite verification results as no other drop outs were detected. PP calculated the drop out rate as 11.32% during the monitoring period. Therefore, it can be confirmed that the emission reductions calculated for the monitoring period are appropriate and conservative. Besides, after verifying the PP's monitoring system, the verification team is of the opinion that robust monitoring mechanism is in place.

4.1.4.4 Monitored Parameters

During the verification, GLC was able to verify through document review and onsite interviews that the monitoring plan was implemented as described in the CPA-DD. The following parameters for the CPA "CPA #1 Improved Cooking Stoves for Nigeria" were monitored during the monitoring period covering from 2011-11-10 to 2012-06-30.

GLC's verification team was able to confirm that all monitoring parameters of which appropriate monitoring is required by the monitoring plan of the registered CPA-DD ^{14/} were indeed monitored during the considered monitoring period. The table below summarizes all the parameters (of which monitoring is required as per the monitoring plan of the registered CPA-DD) which were monitored during the considered monitoring period.

Table 5: Monitored Parameters

Parameter	Description
$N_{\text{eaters, appliance}}$	Average number of eaters per appliance
N_y	Adjusted total number of appliances deployed until period y
DO_y	Statistically adjusted drop out from total population of appliances in period y
η_{new}	Adjusted average efficiency of the system being deployed

The application of the monitoring plan for the verification period is summarized in this section. Table 6 presents the assessment for monitoring details of all parameters monitored during the monitoring period from 2011-11-10 to 2012-06-30.

Table 6: Assessment of monitoring parameters

	Assessment activities
Data / Parameter (as per monitoring plan in the CPA-DD):	$N_{\text{eaters, appliance}}$ (Average number of eaters per appliance)
Type of monitoring equipment:	Not applicable The parameter has been determined by a sample

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	survey.
Verification of data generation:	In order to determine the average number of eaters per appliance, PPs have followed sampling approach as described above and interviewed 46 users of SAVE80 systems selected by computerized randomizer from the 'sales records database' (an electronic database) of SAVE80 users^{/24/}. The information obtained from user interviews has been recorded in the form of questionnaires (called monitoring data sheets). The information from the data sheets has been transferred to excel sheets (called 'inspection database') to determine the average number of eaters per appliance. GLC's verification team was provided with 'sales records database'^{/23/}, monitoring datasheets^{/39/} and inspection database^{/41/} that contain information and calculation. The verification team has also visited households on a sample basis and interviewed the users. Therefore, based on the document review and onsite verification, GLC's verification team is of the opinion that the data generation is correct and the procedures applied by the PPs are appropriate.
Measuring frequency:	Once for this monitoring period
Is measuring frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes. According to the applied methodology and the monitoring plan, if annual inspection is conducted, a 90% confidence interval and a 10% margin of error requirement shall be achieved for the sampled parameters. From the document review it can be confirmed that the achieved precision is less than 10% for a confidence level of 90% and it is considered appropriate for the duration of the monitoring period being less than 1 year.
Is accuracy of the monitoring equipment as stated in the CPA-DD? If the CPA-DD does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practise?	No equipment is used to monitor the parameter. Therefore, accuracy is not applicable.
Verification of data aggregation:	The user interviews were recorded in a questionnaire and the data was manually transferred to inspection database^{/41/}. The data and calculations provided in inspection database were checked by the verification team during desk review and site visit. The verification team confirms that the data aggregation performed by PPs is correct.

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Verification of data recording:	All questionnaires and information gathered during the sampling by the monitoring team are handed over to the managing entity that takes care of entering the information to inspection database and updating databases where appropriate. The verification team was able to check the inspection database ^{41/} as well as the hard copies of data sheets ^{39/} . The verification team thus confirms that the data recording by PPs is correct.
Verification of data calculation and reporting	The calculation has been transparently done in an excel spread sheet by the PPs and provided to the verification team. From the monitoring information, the average number of eaters per appliance is found to be 10.01. However, PP has applied the upper limit of 8 wherever the number of eaters in a particular household exceeds 8. This has resulted in a conservative value of 7.28 for the parameter under assessment. The verification team is of the opinion that the approach and calculation adopted by the PP is appropriate. Besides, the GLC's verification team has visited total number of 68 households and interviewed users during the onsite verification. The onsite interviews resulted an average number of eaters per appliance is 10.11 which is comparable to the value obtained by the PP. The verification interviews resulted slightly higher number as some users provided different number during the PP's monitoring check and GLC's verification check. A clarification request was also raised in this regard (please refer to CL2). The parameter has been considered conservatively for the emission reduction calculation.
Reporting frequency:	Once for the monitoring period
Is reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	The reporting frequency has not been specified either in the applied methodology or the monitoring plan. However, according to the applied methodology and the monitoring plan, if annual inspection is conducted a 90% confidence interval and a 10% margin of error requirement shall be achieved for the sampled parameters. From the document review it can be confirmed that the achieved precision is less than 10% for a confidence level of 90% and it is considered appropriate for the duration of the monitoring period being less than 1 year.
If applicable, has the reported data been cross-checked with other available data?	The parameter has been crosschecked during onsite interviews. The onsite interview results indicate an

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	average number of eaters per appliance is 10.11 which is comparable to the value obtained by the PP. Nevertheless, the upper limit of number of eaters is already capped at 8 eaters per appliance as described in the registered monitoring plan which is a conservative approach.
How were the values in the monitoring report verified?	The parameter has been verified based on sales records database, monitoring data sheets and inspection database provided by the PP. Besides, onsite interviews to users of SAVE80 system have also been conducted by the verification team. Based on the calculation review and onsite interviews it is confirmed that the reported values in the final version of the monitoring report and the corresponding emission reduction calculation sheet^{/14/} are correct.
Does the data management (from monitoring equipment to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, as assessed in section 4.1.4.2, the data management ensures correct transfer of data and reporting of emission reductions and necessary QA/QC processes are in place. For the parameter under assessment, the data is primarily recorded in questionnaires by the monitoring team during the sample survey. During the onsite verification it is assessed that the user interviews were recorded in a questionnaire^{/39/}. The primary data (the questionnaire in hard format) is stored in original format at DARE's office. Scanned copies of the questionnaires are sent to atmosfair, Germany by the monitoring team in Nigeria. The data is electronically stored in central database at atmosfair (Atmosfair gGmbH). Based on the questionnaires, an inspection database^{/41/} is prepared by Atmosfair. Results from the inspection database are used in the preparation of the emission reduction spreadsheet^{/14/} and the monitoring report^{/7/}. The user interview questionnaires and the inspection database were provided to the verification team. The verification team can confirm that the PPs have back up of data in both soft format and hard format.

	Assessment activities
Data / Parameter (as per monitoring plan in the CPA-DD):	N_y (Adjusted total number of appliances deployed until period y)

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Type of monitoring equipment:	Not applicable The parameter is calculated based on the number of SAVE80 systems deployed until the end of monitoring period and fraction of operation time of SAVE80 system during the 1st monitoring period. The data is obtained from sales records database^{/23/}. The calculation is done using following data: $N_y = \sum_{i=1}^y n_i \cdot OT_{adjusted i, y}$ Where, n_i is 'Number of appliances deployed as reported in sales record database'; $OT_{adjusted i, y}$ is 'Adjustment factor for reduced time of operation for appliances deployed in the monitoring period' n_i is monitored through 'PoA Sales Receipts' and sales records database. $OT_{adjusted i, y}$ is calculated by means of number of days SAVE80 in operation. Length of the monitoring period is 234 days (from 2011-11-10 to 2012-06-30) and therefore for stoves sold until 2011-11-10 a factor of 1.0 is applied and for stoves sold after 2011-11-10 and until 2012-05-31 a factor is calculated as the ratio of number of days in operation to the total number of days in the monitoring period.
Verification of data generation:	The stoves are locally assembled and sold to the users by local distributors. When a SAVE80 system is sold, a purchase contract called "PoA Sales Receipt" is signed between the distributor and the user. After delivering the stove to the end user, the distributor submits the sales receipt at the office of DARE. The administrative staffs of DARE then enter the details into sales records database. The database consists of the following information ^{/23/}: • Stove ID • Name of the user • Address of the user • Contact number • Delivery date The number of appliances deployed is determined on

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	the basis of electronic database. The entries in the database were crosschecked with the sales receipts ^{/22/} during the onsite assessment.
Measuring frequency:	Not applicable The data was recorded as and when the cook stoves were sold. There was no fixed frequency of measurement.
Is measuring frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Not applicable However, the monitoring approach can be confirmed to be inline with the monitoring plan.
Is accuracy of the monitoring equipment as stated in the CPA-DD? If the CPA-DD does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practise?	Not applicable No equipment is used to monitor the parameter.
Verification of data aggregation:	The parameter is a calculated value as mentioned above. However, data aggregation on the number of SAVE80 systems deployed was verified by means of sales records database ^{/23/} and sales receipts ^{/22/} . The verification team confirms that the data aggregation performed by PPs is correct.
Verification of data recording:	Data recording was verified by means of document review and onsite interviews with the operating team. When a SAVE80 system is sold, a sales receipt is produced and it is signed by the distributor and the user. The sales receipts are submitted by the distributors at DARE's office. The office staff transfers the data into electronic database. The data is stored properly both in soft and hard formats. During the onsite assessment, the database was crosschecked with the purchase contracts and the information was found to be consistent.
Verification of data calculation and reporting	The calculation has been transparently done in an excel spread sheet by the PPs and provided to the verification team. Number of SAVE80 systems delivered and fraction of operation time have been clearly mentioned in the spread sheet. GLC's verification team has checked and reproduced the calculation and is able to confirm that the parameter has been calculated correctly.
Reporting frequency:	There is no defined frequency to be followed for reporting. As and when certain numbers of stoves are sold, the local distributor submits the sales receipts at the office of DARE. The administrative staff transfers the

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	data into sales records database and stores. The sales receipts in hard format are stored in separate files in the order of delivery date. The verification team has interviewed the local distributors and the administrative staff (together referred as operating team). The operating team confirmed that they received training on CDM requirements of data monitoring. It is the contention of GLC's verification team that the operating team is well trained and capable of following the required procedures.
Is reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Not applicable. No reporting frequency has been defined either in the monitoring plan or in the applied monitoring methodology.
If applicable, has the reported data been cross-checked with other available data?	The reported data on number of systems deployed was cross checked with sales receipts.
How were the values in the monitoring report verified?	The values in the monitoring report were verified by checking and reproducing the calculation of 'adjusted number of appliances deployed'. The number of appliances deployed (n_i) which is used to calculate the parameter under assessment has been verified through the electronic database. The verification team confirms that the calculation and the values provided in the monitoring report are correct.
Does the data management (from monitoring equipment to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	During the onsite verification it is assessed that the primary data sheets ("PoA Sales Receipts")^{22/} are received from the distributors. The information is transferred into sales records database^{23/} at DARE's office. The data in MS-excel format is also copied into memory sticks at the same time as a backup data. The primary data is also stored in original format at DARE's office. The original data sheets are photocopied, sorted out on a group basis, while the original data sheets are sorted out on stove ID basis, and stored in separate files. The photo copied sheets also act as back up data. Scanned or photo copies of the original data sheets are sent to atmosfair, Germany on a regular basis (once in three months). The data is transferred into electronic format and stored in central database at atmosfair (Atmosfair gGmbH). Therefore, the PPs have back up of data in both soft format and hard format. It is therefore confirmed that the data management

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	ensures correct transfer of data and reporting of emission reduction and it is also confirmed that all the required QA/QC procedures are in place.
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	Assessment activities
Data / Parameter (as per monitoring plan in the CPA-DD):	DO_y (Statistically adjusted drop out from total population of appliances in period y)
Type of monitoring equipment:	Not applicable The parameter has been determined through a sample survey by the PP.
Verification of data generation:	The verification team has conducted document check and onsite interviews to verify the data generation. The PP followed appropriate sampling procedures to determine the parameter. A sample was drawn through simple random sampling method from the sales records database using computerised randomiser. The sample of households was visited by a dedicated monitoring team to collect the information such as whether the SAVE80 is in use. The collected information was recorded in the form of questionnaire. The questionnaire was signed by the monitoring team member and the user. The PP initially drew a sample size of 96 considering a response rate of 70% to obtain 67 responses and to achieve the required precision of 10% at 90% confidence level. The 90/10 confidence/precision levels are appropriate since the length of the monitoring period is less than one year. However, PP could achieve the required precision with 53 user interviews. PP has provided all the 53 interview data sheets (also referred as monitoring data sheets)^{/39/} to the verification team. All the interview data sheets have also been checked by the verification team. Besides, users of the SAVE80 were visited and interviewed using a sampling approach by the verification team to confirm the appropriateness of data generation. GLC's verification team is of the opinion that the data generation is correct and the procedures applied by the PPs are appropriate. The sampling approach applied by the verification team has already been discussed above in the report.
Measuring frequency:	Measuring frequency is not applicable for the parameter. However, the sample survey was conducted once during

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	the monitoring period.
Is measuring frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	According to the applied methodology and the monitoring plan, annual inspection shall be carried out at 90/10 confidence/precision level. Since the duration of the monitoring period is less than one year, it can be confirmed that the required monitoring frequency has been met.
Is accuracy of the monitoring equipment as stated in the CPA-DD? If the CPA-DD does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practise?	No equipment is used to monitor the parameter. Therefore, accuracy is not applicable.
Verification of data aggregation:	The PP has collated the information collected through survey into inspection database ^{/41/} and provided to the verification team. The verification team has checked the database and cross checked with the interview data sheets ^{/39/} . The verification team confirms that the data aggregation performed by PPs is correct.
Verification of data recording:	As assessed under 'Verification of data generation', PP has recorded the information in questionnaires by physically visiting the households and interviewing them on a sample basis. All the questionnaires in original have been checked by the verification team during the verification site visit. The verification team confirms that data recording is appropriate and meets the requirements of the monitoring plan.
Verification of data calculation and reporting	The information gathered in the form of questionnaires during the sampling by the monitoring team has been reported to the CME that takes care of transferring the information to an electronic database (inspection database). The calculation has been transparently done in an excel spread sheet by the PPs and provided to the verification team. Sample size and drop-out have been clearly mentioned in the spread sheet. After thorough checking of the calculation, the verification team confirms that 'drop out rate' has been correctly calculated. 6 users out of 53 mentioned that they did not use the SAVE80 stove during the monitoring period which corresponds to a drop out rate of 11.32% ^{/41/} .
Reporting frequency:	The sample survey was conducted once for this monitoring period. The users were interviewed and the

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	information was recorded in questionnaires by the monitoring team and reported to the CME.
Is reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes, the requirement of annual inspection at 90/10 confidence/precision level was met.
If applicable, has the reported data been cross-checked with other available data?	The reported data was crosschecked through user interviews during onsite assessment on a sample basis. The GLC's verification team visited total number of 68 households in 3 states (Kano, Katsina and Kaduna) and interviewed the users. The sampling approach has been described above. Out of 68 users, 22 were from the PP's monitoring list and 46 were randomly picked up during the site visit due to security issues as mentioned above. One of the 22 users indicated that the SAVE80 was not used during the monitoring period. The user revealed that he started using since October 2012 which is after completion of the monitoring period. However, PP's inspection database indicates that the corresponding stove was in use. Therefore, a CAR was raised (please refer to CAR2). The CAR was appropriately addressed by the PP and therefore was closed. Moreover, this was the only one user out of 68 informed that the SAVE80 was not used during the monitoring team. In all other cases, the SAVE80 systems were found to be in use. All the stoves were physically checked to confirm that the SAVE80 systems are in use. The verification team is of the opinion that the PP's information according to sample monitoring check is conservative and therefore it is confirmed that the reported data in the final version of the MR and the corresponding ER sheet is correct.
How were the values in the monitoring report verified?	Following sources have been used for verifying the data and values mentioned in the monitoring report: • Inspection database^{/41/} • Interview questionnaires^{/30/} • Onsite interviews with the operating team • Physical inspection and interviews with the users of appliances Based on the document review and onsite interviews it is confirmed that the reported values in the final version of the monitoring report and the corresponding emission reduction calculation sheet are correct.
Does the data management (from monitoring equipment to emission reduction calculation)	Yes, as assessed in section 4.1.4.2, the data management ensures correct transfer of data and

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ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	reporting of emission reductions and necessary QA/QC processes are in place. For the parameter under assessment, the data is primarily recorded in questionnaires by the monitoring team during the sample survey. During the onsite verification it is assessed that the user interviews were recorded in a questionnaire^{/39/}. The primary data (the questionnaire in hard format) is stored in original format at DARE's office. Scanned copies of the questionnaires are sent to atmosfair, Germany by the monitoring team in Nigeria. The data is electronically stored in central database at atmosfair (Atmosfair gGmbH). Based on the questionnaires, an inspection database^{/41/} is prepared by Atmosfair. Results from the inspection database are used in the preparation of the emission reduction spreadsheet^{/14/} and the monitoring report^{/7/}. The verification team can confirm that the PPs have back up of data in both soft format and hard format. It is therefore confirmed that the data management ensures correct transfer of data and reporting of emission reduction and it is also confirmed that all the required QA/QC procedures are in place.
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	Assessment activities												
Data / Parameter (as per monitoring plan in the CPA-DD):	η_{new} (Adjusted average efficiency of the system being deployed)												
Type of monitoring equipment:	The parameter is determined through water boiling tests. Below mentioned equipments were used to conduct the water boiling tests <u>Weighing scale – Specifications</u> ^{/27/} <table border="1"> <tr> <td>Make</td><td>My Weigh</td></tr> <tr> <td>Type</td><td>KD-8000</td></tr> <tr> <td>Capacity</td><td>8000 g</td></tr> <tr> <td>Accuracy</td><td>± 1 g</td></tr> </table> <u>Thermocouple – Specifications</u> ^{/28/} <table border="1"> <tr> <td>Make</td><td>VOLTCRAFT</td></tr> <tr> <td>Type</td><td>Thermometer with Timer</td></tr> </table>	Make	My Weigh	Type	KD-8000	Capacity	8000 g	Accuracy	± 1 g	Make	VOLTCRAFT	Type	Thermometer with Timer
Make	My Weigh												
Type	KD-8000												
Capacity	8000 g												
Accuracy	± 1 g												
Make	VOLTCRAFT												
Type	Thermometer with Timer												

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	Range	0 – 200°C	
	Accuracy	± 1°C	
Verification of data generation:	Water boiling tests were conducted to determine the efficiency of the SAVE80 cook stove. Tests reports and the calculations were made available to the verification team. 19 SAVE80 cook stoves were tested in this monitoring period on a sample basis and the results achieved a precision of 2% at 90% confidence level. From the document review and onsite assessment, it is confirmed that standard test protocol was followed by the PP for data generation.		
Measuring frequency:	Once for this monitoring period The tests were conducted after completion of the monitoring period during August – October 2012.		
Is measuring frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes, annual monitoring at 90/10 confidence/precision levels as required by the applied methodology and the monitoring plan was followed.		
Is accuracy of the monitoring equipment as stated in the CPA-DD? If the CPA-DD does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practise?	Neither the CPA-DD nor the applied methodology specifies the accuracy of monitoring equipment used in the water boiling tests. However, the verification team based on the sectoral expertise confirms that the accuracy of monitoring equipment is appropriate.		
Verification of data aggregation:	The values of all the parameters obtained during water boil tests were recorded on test protocols and then transferred to excel sheets. By comparing the data in excel sheets with the original protocols and by checking and reproducing the calculation in excel sheet, it is confirmed that the data aggregation is correct.		
Verification of data recording:	The verification team has checked hand written water boiling test data sheets ^{/40/} and efficiency calculation sheets ^{/43/} to confirm that the data recording follows appropriate procedures. The project participants have developed standard protocol ^{/26/} to conduct the water boiling tests and the monitoring team was trained to carry out the test. A standard document with title “Water Boiling Test (WBT) Instruction and Data Entry Form was developed which contains instructions and also provision to enter the values read during the test. From the onsite interviews and water boiling test agreement ^{/32/} it is confirmed that two persons (Tester-1 and Tester-2) from the monitoring team are involved to conduct a test; one person (Tester-1) reads the instruction and the other person (Tester-2) does the physical activity as per the instructions and reads the measured values from the		

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	monitoring equipment. The same person who reads the instructions enters the values in the sheet. Both the persons sign the document at the end of the test. The procedure is confirmed to be correct based on a sample test that was conducted in presence of the verification team during the onsite assessment. The WBT procedure has also been crosschecked with the documented instructions to conduct the test^{/31/} and WBT test agreement for Tester-1 and Tester-2^{/32/}. Besides, the tests were supervised by DARE's CDM monitoring officer. Therefore, data recording is confirmed to be appropriate.
Verification of data calculation and reporting	GLC has reproduced the calculation and is able to confirm the value is correct. Calculation of the average efficiency was done at 90/10 confidence/precision as required by the methodology (AMS II.G. ver. 3) for the inspection frequency (< 1 year) chosen, following the statistical standard approach. The average of the 19 tests was calculated to be 40.47%^{/41/} and the achieved precision level was 2% at 90% confidence level which is well within the limits.
Reporting frequency:	Once for this monitoring period
Is reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes, the data is recorded and reported at the time of measurement. The reporting frequency is deemed in accordance with the monitoring plan and the monitoring methodology.
If applicable, has the reported data been cross-checked with other available data?	The reported data was cross checked with the manufacturer's specification^{/29/} which indicate thermal efficiency as 52%. The efficiency determined during the monitoring period is conservative. Besides, a water boiling test was also conducted to determine the efficiency of SAVE80 system in presence of the verification team during onsite assessment. The efficiency was determined to be 43% which is inline with the efficiency determined during the monitoring period of 40.47%. The verification team can, therefore, confirm that the reported data is appropriate.
How were the values in the monitoring report verified?	The reported values in the monitoring report were verified based on the water boiling test data sheets^{/40/} and efficiency calculation sheets^{/43/}. After thorough checking of the documents, the verification team confirms that the reported values in the monitoring report and the corresponding emission reduction calculation

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Does the data management (from monitoring equipment to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	spread sheet^{/14/} are correct. Yes. For the parameter under assessment, the data is primarily recorded in WBT datasheets^{/40/} by the monitoring team during the sample tests. The primary data (WBT datasheets in hard format) is stored in original format at DARE's office. Scanned copies of the datasheets are sent to atmosfair, Germany by the monitoring team in Nigeria. The data is electronically stored in central database at atmosfair (Atmosfair gGmbH). The data is transferred to excel sheets^{/43/} and the efficiency calculation is performed by the atmosfair. Based on the datasheets and the efficiency calculation sheets, an inspection database^{/41/} is also prepared by Atmosfair. Results from the WBT test calculation sheets and the inspection database are used in the preparation of the emission reduction spread sheet^{/14/} and the monitoring report^{/7/}. The verification team can confirm that the PPs have back up of data in both soft format and hard format. It is therefore confirmed that the data management ensures correct transfer of data and reporting of emission reduction and it is also confirmed that all the required QA/QC procedures are in place.
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Thus GLC confirms that

- the monitoring activities comply with the monitoring plan of the registered PoA-DD^{/2/} and CPA-DD^{/4/}.
- all parameters that are baseline, project and leakage emission parameters are monitored as described in the registered monitoring plan.
- the frequency of monitoring and the accuracy of the measurement equipments are in line with the registered monitoring plan.

Based on the document review and on-site visit interviews, GLC verifies that the registered monitoring plan is implemented as planned and confirms that the operational and management system is implemented as per the registered monitoring plan.

During the on-site visit the verification team was able to verify that monitoring organization structure is in line with monitoring plan of the registered CPA-DD and monitoring report. Moreover, the verification team has interviewed the personnel and verified certain documents, like interview questionnaire^{/39/} and water boiling test reports^{/40/}. A monitoring mechanism which was established by Atmosfair gGmbH was found to be in place and working properly.

GLC was able to verify that authorities and responsibilities for monitoring and reporting of all data related to the emission reductions were clearly defined for this monitoring period. Moreover, all SAVE 80

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users were given demonstration by qualified and trained staff. The frequency of monitoring and reporting details were conducted as outlined in the monitoring plan available in the registered CPA-DD^{/4/}.

Sufficient monitoring procedures are in place with CME to monitor all the CPAs in the PoA. The data pertaining to each CPA (the first CPA and other CPAs that will be included) is monitored separately and stored in the central database. It is confirmed that the monitoring system for the PoA is as described in the registered PoA-DD. The database for each CPA is identified with the CPA ID number. All the ICS sold under a CPA are uniquely numbered. Therefore, verification team can confirm that the CME is capable of implementing and managing the PoA as described in the PoA-DD. The description provided in the monitoring report^{/7/} is deemed appropriate.

4.1.5 Compliance with the Calibration Frequency Requirements for Measuring Instruments

Assessment on compliance with the calibration frequency requirements for measuring equipment has been provided in below table. It is to be noted that only one out of the four monitoring parameters requires the use of monitoring equipment. Therefore, the calibration assessment is provided for the monitoring equipments used to monitor the parameter (η_{new}).

Table 7: Assessment of calibration of measuring equipment

	Assessment activities
Data / Parameter (as per monitoring plan in the CPA-DD):	η_{new} / Adjusted average efficiency of the system being deployed
Calibration frequency /interval:	Not applicable
Is the calibration interval in line with the monitoring plan of the CPA-DD? If the CPA-DD does not specify the frequency of calibration, does the selected frequency represent good monitoring practise?	No calibration interval is applicable for the monitoring parameter. Neither the CPA-DD nor the applied methodology specifies the calibration requirements. However, Efficiency of SAVE80 system is determined on an annual basis by performing water boiling tests which require a weigh scale and a thermometer. The weigh scale is used for measuring the weight of water and the weight of fuel consumed and the thermometer is used to read the temperature of water. The operation manual ^{/27/} of the weigh scale provided by the supplier was made available to the verification team. The manual states, "This scale was professionally factory calibrated before shipment. It does not need to be recalibrated before use and will not usually require calibration during its lifetime." Thus the selected frequency is as per the manual instruction and represent good monitoring practise. The user manual of thermometer (VOLTcraft) ^{/28/} was also provided to the verification team. However,

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	the manufacturer does not recommend any calibration frequency. Therefore, the verification team is of the opinion that the calibration of measuring equipment is deemed appropriate.
Company performing the calibration:	The measuring equipments were calibrated by the manufacturer at the time of supply.
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	Not applicable
Is(are) calibration(s) valid for the whole reporting period?	Yes

Therefore, based on document review and onsite verification, it is the contention of GLC that all the requirements of the monitoring plan have been sufficiently followed.

4.1.6 Assessment of Data and Calculation of Emission Reductions

A complete check was performed by the audit team on the emission reduction calculation and the input data which has been verified by project database^{/23/} and cross-checked with sales receipts^{/22/} and interview questionnaire. Thus the verification team is convinced that the number of appliances deployed in this monitoring period is reliable. The following ex-ante parameters have also been used for the emission reduction calculation:

Table 8: Ex-ante parameters

Parameter	Value
$B_{old, capita}$, Average baseline fuelwood consumption per capita per year (ton/year)	0.692
η_{old} , Efficiency of the baseline system being replaced	0.1
L_{NRB} , Net-to-gross adjustment factor for NRB Leakage	0.95
L_{PoA} , Net-to-gross adjustment factor for PoA Leakage	0.95
$f_{NRB, y}$, Fraction of woody biomass saved by the CPA in period y that can be established as non-renewable biomass	0.77
$NCV_{biomass}$, Net calorific value of the non-renewable woody biomass that is substituted (TJ/ton)	0.015
$EF_{projected_fossilfuel}$, Emission factor for the substitution of non-renewable biomass by similar consumers (tCO ₂ /TJ)	81.6
HH_CAP , Maximum number of eaters possible per specific ICS as applied in the specific CPA	8 (Not used for emission reduction calculation. Used only as cap for monitored parameter)

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$\eta_{\text{specified}}$, Efficiency of the system being deployed as per manufacturer specification	52 (Not used for emission reduction calculation. Used only for ex-ante estimation)
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GLC's verification team confirms that all the ex-ante parameters have been correctly applied as determined during the validation and as mentioned in the registered CPA-DD. The parameters have been correctly mentioned in section D.1 of the MR.

GHG emissions reductions were correctly calculated in the latest version (version 2.1) of the monitoring report for the monitoring period from 2011-11-10 to 2012-06-30 using the quantity of woody biomass that is saved by the CPA in the 1st monitoring period multiplied by $f_{\text{NRB},y}$, NCV_{biomass} , $EF_{\text{projected_fossilfuel}}$. The total emission reductions are 2,376 tCO₂e for the reported period.

It was verified in the course of this verification that the methodology has been correctly and accurately applied in calculating the total emission reductions and the emission reduction calculation is deemed accurate. All calculations in the monitoring report and Emission Reduction calculation sheet^{/14/} are in line with the methodology AMS-II.G "Energy Efficiency Measures in Thermal Applications of Non-Renewable Biomass" version 03 ^{/8/}. Following formulae have been correctly applied to calculate the emission reduction.

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

Where,

ER_y : Emission reductions during the year in t CO₂e

$B_{y,\text{savings}}$: Quantity of woody biomass that is saved in tonnes

$f_{\text{NRB},y}$: Fraction of biomass saved by the CPA in year y that can be established as non-renewable biomass using survey methods

NCV_{biomass} : Net calorific value of non-renewable biomass that is substituted

$EF_{\text{projected_fossilfuel}}$: Emission factor for the substitution of non-renewable biomass by similar consumers

Calculation of Biomass Savings ($B_{y,\text{savings}}$):

$$B_{y,\text{savings}} = B_{\text{old}} \cdot \left(1 - \frac{\eta_{\text{old}}}{\eta_{\text{new}}}\right)$$

Where,

B_{old} : Quantity of woody biomass used in the absence of the CPA

η_{old} : Efficiency of the baseline system being replaced

η_{new} : Efficiency of the system being deployed as part of the CPA

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The calculation has been thoroughly checked and is confirmed to be correct by reproducing the same. As a conclusion, GLC thus confirms that the reported emission reductions for verification period from 2011-11-10 to 2012-06-30 were determined in a transparent, correct and consistent manner, and in accordance with all measurement, reporting and calculation requirements of the monitoring plan of the CPA-DD, monitoring methodology AMS-II.G and of all applicable CDM tools and standards. GLC thus confirms that, as presented in the latest versions of the summarized emission reduction spreadsheet and monitoring report, the project has achieved GHG emission reductions as follows:

Emission reductions for the verification period from 2011-11-10 to 2012-06-30 :	2,376 tCO ₂ e
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4.2 Post Registration Changes

This assessment:

- ☒ Does not include any post registration changes and therefore this section is not applicable to this PoA/included CPAs.
- ☐ Includes changes as part of the request for issuance. The assessment of the changes is done in a separated document.
- ☐ Includes changes that required prior approval of the Board. The assessment of the changes was done in a separated document.

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5 VERIFICATION STATEMENT

Germanischer Lloyd Certification GmbH (GLC) has performed the 1st verification of the CDM PoA "Improved Cooking Stoves for Nigeria Programme of Activities" with regard to the relevant requirements for CDM Programme of Activities. The project reduces GHG emissions due to reduction in the use of non-renewable biomass by using SAVE 80 system which saves up to 80% fuel wood over conventional 3 stone stoves. This verification covers the period from 2011-11-10 to 2012-06-30 (including both days). Only one CPA "CPA #1 Improved cooking stoves for Nigeria" was included in the PoA by the end of the monitoring period.

It is GLC's responsibility to express an independent verification statement on the reported GHG emission reductions from the project. GLC does not express any opinion on the selected baseline scenario or on the validated and registered PoA-DD and CPA-DD. GLC conducted the verification on the basis of the monitoring methodology AMS-II.G (version 03) "Energy Efficiency Measures in Thermal Applications of Non-Renewable Biomass", the monitoring plan included in the CPA-DD of the project and the monitoring report.

The verification included:

- i) verifying whether the implementation and monitoring of the PoA is in accordance with the registered PoA-DD;
- ii) checking whether the CPA is implemented and installed as planned and described in the CPA-DD;
- iii) checking whether the provisions of the monitoring methodology and the monitoring plan in the CPA-DD were consistently and appropriately applied;
- iv) the collection of evidence supporting the reported data;
- v) checking whether the installed equipment essential for measuring parameters required for calculating emission reductions are calibrated appropriately

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

In GLC's opinion, the GHG emissions reduction for the "CPA #1 Improved Cooking Stoves for Nigeria" as reported in the final Monitoring Report are calculated without considerable misstatements in a conservative and appropriate manner. The GHG emission reductions were correctly calculated on the basis of the approved monitoring methodology mentioned above and the monitoring plan contained in the validated CPA-DD for the project.

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Germanischer Lloyd Certification GmbH herewith confirms that the project has achieved emission reductions in the above mentioned reporting period as follows:

Emission reductions: 2,376 t CO_{2e}

Hamburg, 2013-03-13

Germanischer Lloyd
Certification

Markus Weber

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6 REFERENCES

Reference	Author: Title, version, date of issue
/1/	CDM-EB: Clean Development Mechanism Validation and Verification Standard (version 03)
/2/	Atmosfair gGmbH: CDM-SSC-PoA-DD: "Improved Cooking Stoves for Nigeria Programme of Activities" version 2.3, dated 2011-10-24
/3/	Atmosfair gGmbH: CDM-SSC-CPA-DD Generic: "CPA # [xxx] Improved Cooking Stoves for Nigeria", version 2.1, dated 2011-10-24
/4/	Atmosfair gGmbH: CDM-SSC-CPA-DD specific: "CPA # 1 Improved Cooking Stoves for Nigeria", version 2.1, dated 2011-10-24
/5/	TUV Nord: Validation Report for CDM PoA "Improved Cooking Stoves for Nigeria Programme of Activities" version 01, dated 2011-11-07
/6/	Atmosfair gGmbH: Monitoring Report for the PoA including the "CPA # 1 Improved Cooking Stoves for Nigeria", version 01, dated 2012-10-29
/7/	Atmosfair gGmbH: Monitoring Report for the PoA including the "CPA# 1 Improved cooking stoves for Nigeria", version 02.1, dated 2013-01-16
/8/	CDM-EB: Approved CDM Methodology AMS-II.G, version 03: " Energy Efficiency Measures in Thermal Applications of Non-Renewable Biomass "
/9/	Germanischer Lloyd Certification GmbH CDM GHG Services Manual (incl. procedures and forms)
/10/	IPCC: 2006 IPCC Guidelines for National Greenhouse Gas Inventories: work book
/11/	UNFCCC: Kyoto Protocol to the United Nations Framework Convention on Climate Change (1998)
/12/	UNFCCC: Decision 3/CMP. 1 (Marrakesh – Accords)
/13/	Atmosfair gGmbH: Emission reduction calculation spreadsheet, version 01 < Nigeria_5067_MP1_v.1_final_291012_ER_Spreadsheet.xls>

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/14/	Atmosfair gGmbH: "Emission reduction calculation spreadsheet", version 02.1 < Nigeria_5067_MP1_v.2.1_final_160113_ER_Spreadsheet.xls>
/15/	CDM-EB: Demonstration of additionality, development of eligibility criteria and application of multiple methodologies for programmes of activities (version 02.1)
/16/	CDM-EB: Guidelines for completing the monitoring report form (version 02.0); EB 66, Annex 20
/17/	CDM-EB: Guidelines on completeness check of requests for issuance (version 01); EB 48, Annex 68
/18/	CDM-EB: CDM project cycle procedure, Version 03.0 (EB 70)
/19/	CDM EB: General guidelines for sampling and surveys for small-scale CDM project activities (version 01); EB 50
/20/	CDM EB: Standard for sampling and surveys for CDM project activities and programme of activities (version 02); EB 65, Annex 2
/21/	CDM EB: Best practices examples focusing on sample size and reliability calculations (version 01); EB 67, Annex 6
/22/	Atmosfair gGmbH: "PoA Sales Receipt" for the cook stoves from 2011-03-29 to 2012-05-31 (2011-03-29 is the date on which the first ICS was delivered and 2012-05-31 is the last date of ICS delivery considered for emission reduction calculation)
/23/	Atmosfair gGmbH: Sales records database from 2011-03-29 to 2012-05-31
/24/	Atmosfair gGmbH: Sales database and randomly selected list for monitoring check < 1.1_Sales database and random generator_poa_mp1.xls>
/25/	Atmosfair gGmbH: Monitoring List for the monitoring period < 1.2_Monitoring List BIA.xlsx>; < 1.3_PoA-Monitoring List DARE_2012.xlsx>
/26/	Atmosfair gGmbH: Water Boiling Test (WBT) Instruction and Data Entry Form
/27/	My Weigh: "KD 8000 Manual – weigh scale manual"
/28/	VOLTCRAFT: "Operating instruction - thermometer with timer", version 05/09
/29/	KOCH Anhängerwerke GmbH & Co. KG: Manufactures specifications of Save80 cook stove system, dated 2011-08-18

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/30/	Atmosfair: DARE User Manual for Database Software, dated 2011-11-11
/31/	Atmosfair: Instructions for atmosfair WBT coordinator, dated 2012-05-25
/32/	Atmosfair: WBT testing agreement for Tester 1 and for Tester 2, dated 2012-05-25
/33/	CDM-EB: Standard for Sampling and Surveys for CDM Project Activities and Programme of Activities (version 03.0); EB 69, Annex 4
/34/	CDM-EB: Guidelines for Sampling and Surveys for CDM Project Activities and Programme of Activities (version 02.0); EB 69, Annex 5
/35/	DARE: List of Internal and External Trainings, Workshops and Conferences DARE employees attended
/36/	Energy Commission of Nigeria: Certificate of Attendance for Lawrence Ijibo; 2011-12-20
/37/	Energy Commission of Nigeria: Certificate of Attendance for Yahaya Ahmed; 2011-12-20
/38/	Atmosfair: CDM PoA Manual, version 2.0, February 2012
/39/	Atmosfair: PoA monitoring campaign 2012 (questionnaire – user interviews) for 53 users
/40/	Atmosfair gGmbH: Water boiling tests – Instructions and Data Entry Forms (WBT datasheets) dated 2012-08-18 to 2012-10-21
/41/	Atmosfair: Inspection Database; < 3.1_PoA Inspection database MP1.xlsx >
/42/	Atmosfair: Sample size calculation spread sheet; <1.0_Sample size calculation (eb67_an6).xls> <3.2_Sample size calculation (eb69_an5).xls>
/43/	Atmosfair gGmbH: WBT Test Entry Form and Calculation sheets • < WBT_00046_all_n.xls> • < WBT_00200_all_n.xls> • < WBT_00369_all_n.xls> • < WBT_00374_all_n.xls> • < WBT_00816_all_n.xls> • < WBT_01132_all_n.xls> • < WBT_01148_all_n.xls>

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	• < WBT_01263_all_n.xls> • < WBT_01829_all_n.xls> • < WBT_01949_all_n.xls> • < WBT_2042_all_n.xls> • < WBT_02353_all_n.xls> • < WBT_Data Calculation Sheet_ ID 2042_all.xls> • < WBT_Data Calculation Sheet_ ID 111_all.xls> • < WBT_Data Calculation Sheet_ ID 254_all.xls> • < WBT_Data Calculation Sheet_ ID 272_all.xls> • < WBT_Data Calculation Sheet_ ID 1832_all.xls> • < WBT_Data Calculation Sheet_ ID 1857_all.xls> • < WBT_Data Calculation Sheet_ ID 2033_all.xls>
/44/	CDM-EB: Procedures for Registration of a Programme of Activities as a single CDM Project Activity and Issuance of Certified Emission Reductions for a Programme of Activities (version 04.1); EB 55, Annex 38

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ANNEX A: RESOLUTION OF CORRECTIVE ACTION AND CLARIFICATION REQUESTS (LIST OF FINDINGS)

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Resolution of Corrective Action and Clarification Requests including list of Forward Action Requests

Description of Finding (CAR, CL, FAR) <i>Describe the finding in a transparent manner i.e. state clearly what is required and why; address the context (e.g. section)</i>	Project Participants Response <i>This section shall be filled by the PP. The finding shall be addressed with suitable arguments and evidence</i>	GLC's Assessment <i>The assessment shall include how the finding is closed i.e. how it is found that the response is assessed to be appropriate and meeting the specific requirement of the finding. In case the response is not satisfactory, additional response and DOE assessments (#2, #3, etc.) shall be sought.</i>	Final Conclusion (OK or OPEN)
CAR 1 (2012-12-05) One of the users corresponding to the stove ID 00191 revealed during the onsite verification that he uses both SAVE80 and also conventional 3 stone stove for cooking.	2012-12-20 (1 st round): As per the methodology, if baseline stove use continues, this has to be monitored and factored in the emission reduction calculation. For this reason, there is the monitoring parameter number of eaters, to deduct any continuous use of the baseline stove. During the monitoring checks, the users were asked for how many eaters they cook on the ICS, therefore taking into account that users may continue to use the baseline stove. Secondly, the number of eaters is capped at 8, whereas the number of eaters as determined during the monitoring checks is higher (> 10), therefore ensuring overall conservativeness of emission reduction calculation.	2013-01-10 (1 st round) OK. From the PDD, it is confirmed that Quantity of woody biomass used per appliance in the absence of the project activity (B old, appliance) was determined as product of Average baseline fuelwood consumption per capita per year (B old, capita) and Average number of eaters per project appliance (N eaters, appliance). The number of eaters per appliance has been monitored during the monitoring period. It is observed that the average number of eaters without capping during the monitoring check was 10.01	OK

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		while it is 10.11 during verification check. However, the number of eaters is capped at 8 in order to be conservative. The verification team understands that one user (out of the total number of 68 users interviewed during the onsite verification) who mentioned to be using both SAVE80 and conventional 3 stone stove has already been taken care by the conservative approach followed by the PP in calculating the emission reduction. Therefore, the CAR is closed.	
CAR 2 (2012-12-05) The onsite interview with the user of stove ID 01942 revealed that the stove was put in use only since October 2012 which indicates that it was not in use during the monitoring period. However, the inspection database indicates that the stove was in use.	2012-12-20 (1st round): There is a deviation compared to what the user mentioned when he was visited by the monitoring team in September 2012, however, given that the number of deviations between the PP monitoring checks and the DOE checks is below the acceptance number and average % of drop outs during DOE check was lower than in the PP monitoring checks, from PP point of view this is acceptable. However, to be more conservative, the user was removed from the database since he was now mentioning that he had only put the stove in use in October, which is after the end of	2013-01-10 (1st round) OK. As per the PP's monitoring check, the number of drop outs is 6 out of 53 which is higher compared to the results obtained during verification check. Only one out of total number of 68 users was found to be not using the SAVE80 system. Since PP's calculation of emission reduction is conservative, the response is deemed appropriate. The revised	OK

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	the monitoring period. Therefore also MR and CER spreadsheet was updated to version 2.1	MR and ER sheet deemed appropriate. Therefore, the CAR is closed.	
CAR 3 (2012-12-05) Sources of all inputs in the spreadsheet for emission reduction calculations have not been provided sufficiently.	2012-12-20 (1 st round): Ok, spreadsheet was changed accordingly.	2013-01-10 (1 st round) OK. All the sources of inputs have been provided in the spreadsheet. The CAR is closed.	OK
CAR 4 (2012-12-05) Efficiency calculation provided in excel sheets (WBT calculation sheets) is not reproducible. PP is requested to provide the excel documents in Office 2003 compatible format	2012-12-20 (1 st round): Efficiency calculation provided in excel sheets (WBT calculation sheets) is now reproducible in Office 2003 compatible format.	2013-01-10 (1 st round) 'Test Results' sheet of the WBT calculation spreadsheets is protected. An unprotected is required to verify the formula and results.	OK
	2013-01-16 (2 nd round): Sheets are now provided in unprotected manner.	2013-01-18 (2 nd round) OK. Unprotected version of the WBT calculation spreadsheets has been provided. The calculation is now reproducible. It is confirmed that all the excel documents are in Office 2003 compatible format. Therefore, the CAR is closed.	

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CL 1 (2012-12-05) It has been stated in section E.4 of the PoA-DD, <i>"The most plausible baseline scenario is hence that firewood, charcoal from non-renewable sources and to a lower extent fossil fuels are supplying thermal energy for the users. However, any savings from reduced usage of fossil fuels will not be counted towards emission reductions since the ICS will replace traditional appliances that were using non-renewable biomass and savings from reduced Kerosene usage is a positive side effect but will not be further considered."</i> However, during the onsite interview several of the users revealed that they were using Kerosene stoves before buying SAVE80 stoves. Therefore, it is not clear how the statement in the PoA-DD is fulfilled.	2012-12-20 (1st round): The statement is fulfilled because the users may have used Kerosene stoves before adopting the new ICS, but they have also used the traditional fireplaces as confirmed by them on the sales receipts, where it is mentioned: "I herewith confirm that up to now wood and/or charcoal has been used as cooking fuel". The reduction of Kerosene use can be a positive side effect in case users reduce cooking on the Kerosene stove, however, since they are not obliged to do so they may also continue to use the Kerosene stoves along with the ICS. On the other hand, PPs do not quantify the emission reductions from reduced Kerosene use since the only scenario allowed in the methodology is the reduction of wood consumption and hence less CO₂ emissions stemming from burning non renewable wood. The fact that the emission factor itself is a fossil fuel based emission factor is not related to the question whether people are using fossil fuels or not, it is only a methodology requirement. For explanation on why UNFCCC decided to use a fossil fuel based emission factor instead of the emission factor for wood, which would actually lead to much higher emission reductions, please refer to the call for public input on the methodology AMS II.G. Besides, the baseline woody biomass	2013-01-10 (1st round) OK. It is understood that the baseline woody biomass consumption is based on the average consumption among the whole Nigerian population whereas the target group of the PoA are only those users who previously used the firewood and/or charcoal. The users have also confirmed, in sales receipts, while purchasing that they were using wood and/or charcoal as cooking fuel. It is also evident from the PDD that the default value of the emission factor for the substitution of non-renewable biomass is 81.6 tCO₂/TJ which is conservative compared to emission factor for wood of 112 tCO₂/TJ. The response is deemed appropriate and therefore the CL is closed.	OK
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	consumption is based on the average consumption among the whole Nigerian population, whether they are using wood fuel or not; and hence it is per se conservative as the target group of the PoA are only those users who previously used the firewood and/or charcoal. Nonetheless, when the distributors are delivering the ICS to the end users, they are aware of the fact that only those are eligible to participate in the CDM PoA who have used the woody biomass in the baseline and are instructed to deliver only to these households.		
CL 2 (2012-12-05) There is a considerable difference in number of eaters between monitoring spot check and verification check. Several users have provided different number during verification interview compared to the available information during monitoring check. A clarification is sought from the PP.	2012-12-20 (1st round): During the monitoring checks, the number of eaters was found to be more > 10 in average but in case of a household exceeding 8 persons per household it was capped at 8 in line with the requirements of the monitoring plan. Also during the verification check, the number of eaters was >10, and when capped at 8, there was no great difference between the number of eaters. But it is possible that in some few cases the numbers differed because the question was not asked exactly the same way. During the verification check, the household size was asked or the question for "how many people does the stove serve". Especially Muslim households also cook for their neighbours. This explains why there are	2013-01-10 (1st round) Ok. It is observed that the average number of eaters without capping during the monitoring check was 10.01 while it is 10.11 during verification check. Though there is a variation in number of eaters, it does not have any impact on emission reduction since it is capped at 8 which results in conservative estimation of emission reduction. The users have also informed during the onsite verification interview that they also feed others very often. Therefore, there is a possibility	OK

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	some few differences.	that the users have provided different number during monitoring check. The response is deemed appropriate. Therefore, the CL is closed.	
CL 3 (2012-12-05) Some of the stoves were not found to be in operation during the monitoring spot check by the PP. Therefore, 6 stoves corresponding to 11.32% have been considered as drop out for the monitoring period. This is a conservative approach adopted by the PP and inline with the monitoring plan requirements. However, it is not clear if the identified will be removed from the database or what action would be taken against those stoves for the next monitoring periods. The database submitted to the verification team contains the drop out stoves also.	2012-12-20 (1 st round): The drop outs were determined from the PP sample. 6 stoves were found not in operation in the monitoring period, corresponding to 11.32% of the total population of stoves, which means 285 stoves out of the 2,515 stoves in the sales database. Removing the 6 cases from the sales database would not be statistically correct because the 279 remaining drop outs in the sales database are not known and hence cannot be removed. However, since during the upcoming verifications a representative sample from the total population (i.e. all stoves delivered) will always be drawn the drop outs from the former monitoring periods (in case they persist) will again be detected.	2013-01-10 (1 st round) OK. The provided response deemed appropriate. As annual monitoring check is required, the verification team is of the opinion that any drop outs would be detected during the monitoring spot checks and the emission reductions would be corrected accordingly for the next monitoring periods. Therefore, the CL is closed.	OK
CL 4 (2012-12-05) In the spreadsheets, "1.0_Sample size calculation.xls" and "3.2_Sample size calculation.xlsx" (para 16 - 26), (para 51 - 57) and (para 246) etc are referred. It is not clear which document is referred to.	2012-12-20 (1 st round): Document is EB 67 Annex 6 and EB 69 Annex 5, as mentioned in the file name. EB 67 Annex 6 are the sampling best practices examples, which meanwhile are contained in EB 69 Annex 5 (sampling guidelines).	2013-01-10 (1 st round) PP is required provide the reference clearly in the sheet (not in the title) for the sake of clarity. Also provide the excel document in 2003 format.	OK

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	2013-01-16 (2 nd round): The reference is now also mentioned in the sheet and documents are also provided in the Excel 2003 format.	OK. The reference to EB documents has been mentioned in the spread sheets. The CL is closed.	
CL 5 (2012-12-05) It is mentioned in section B.1 of the MR, " <i>Not all ICS that were sold until the end of the Monitoring Period were already recorded in the database</i> ". However, the reason for this is not understood. Besides, it is not clear if all the stoves under this CPA have already been distributed or if there are any more stoves to be distributed.	2012-12-20 (1 st round): There is a time lag between delivery of the stoves to the end user & signing of the sales receipts and, delivery of the receipts to DARE and the necessary data transfer to the database. As evidenced during the on site visits, distances are often far; local focal points can only hand out the receipts to the DARE team from time to time when they physically meet because post mail does not work in Nigeria and transfer by scanning the documents and uploading through the internet is often not possible because of low internet connectivity. Therefore there are some users that received an ICS, but where the sales receipt was not received by the DARE team in time or the database record was not created in time, because PP had to conduct the monitoring campaigns within a reasonable timeframe after the end of the monitoring period. In the meantime the CPA has been filled up to the maximum number of 3,200 ICS, however, if e.g. stoves are not counting in the CPA because of drop out, the CPA may be filled again with new ICS up to the maximum number of 3,200	2013-01-10 (1 st round) OK. From the onsite assessment, it is understood that there would be a time lag between delivery of the stoves and submitting the purchase contracts at DARE's office since the project is spread over a larger area. Therefore, the initially submitted database might not contain all the users who obtained the stoves before the end of the monitoring period. It is understood that all the stoves under this CPA have been distributed. However, to make up the drop outs, additional number of stoves may be supplied. This is considered to be appropriate. The response is deemed appropriate. Therefore, the CL is closed.	OK

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	operational ICS.		
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