




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

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

**BASIC INFORMATION**

<b>Title and UNFCCC reference number of the programme of activities (PoA)</b>	Up Energy Improved Cookstove Programme, Uganda UNFCCC PoA reference number: 9956	
<b>Version number(s) of the PoA-DD(s) to which this report applies</b>	Version 4.0	
<b>Version number of the verification and certification report</b>	03	
<b>Completion date of the verification and certification report</b>	05/06/2020	
<b>Monitoring period number and duration of this monitoring period</b>	Sixth Monitoring Period 16/08/2019 - 31/01/2020 (including both the days)	
<b>Number and version number of the monitoring report to which this report applies</b>	Monitoring report number 1, version 2.0 (Dated: 22/05/2020)	
<b>Coordinating/managing entity (CME)</b>	UpEnergy Group	
<b>Host Parties</b>	Host Parties of the PoA	Is this a host Party to a CPA covered in this report? (yes/no)
	Uganda	Yes
<b>Applied methodologies and standardized baselines</b>	AMS-II.G., version 05, "Energy efficiency measures in thermal applications of non-renewable biomass"	
<b>Mandatory sectoral scopes</b>	3: Energy demand	
<b>Conditional sectoral scopes, if applicable</b>	Not applicable	
<b>Estimated amount of GHG emission reductions or GHG removals for this monitoring period in the included CPAs covered in this report</b>	9956-P1-0001-CP1: 20,721 tCO <sub>2</sub> e 9956-P1-0002-CP1: 20,769 tCO <sub>2</sub> e 9956-P1-0003-CP1: 20,769 tCO <sub>2</sub> e 9956-P1-0004-CP1: 20,769 tCO <sub>2</sub> e 9956-P1-0005-CP1: 20,769 tCO <sub>2</sub> e 9956-P1-0006-CP1: 20,769 tCO <sub>2</sub> e 9956-P1-0007-CP1: 20,769 tCO <sub>2</sub> e 9956-P1-0008-CP1: 20,769 tCO <sub>2</sub> e 9956-P1-0009-CP1: 20,769 tCO <sub>2</sub> e 9956-P1-0010-CP1: 20,769 tCO <sub>2</sub> e 9956-P1-0011-CP1: 20,769 tCO <sub>2</sub> e 9956-P1-0012-CP1: 20,769 tCO <sub>2</sub> e 9956-P1-0013-CP1: 6,527 tCO <sub>2</sub> e 9956-P1-0014-CP1: 6,527 tCO <sub>2</sub> e 9956-P1-0015-CP1: 6,527 tCO <sub>2</sub> e 9956-P1-0016-CP1: 6,527 tCO <sub>2</sub> e 9956-P1-0017-CP1: 6,527 tCO <sub>2</sub> e 9956-P1-0018-CP1: 6,527 tCO <sub>2</sub> e 9956-P1-0019-CP1: 6,527 tCO <sub>2</sub> e 9956-P1-0020-CP1: 6,527 tCO <sub>2</sub> e	

	9956-P1-0021-CP1: 6,527 tCO <sub>2</sub> e 9956-P1-0022-CP1: 6,527 tCO <sub>2</sub> e 9956-P1-0023-CP1: 6,527 tCO <sub>2</sub> e <b>Total 320,979 tCO<sub>2</sub>e</b>
<b>Certified amount of GHG emission reductions or GHG removals for this monitoring period for the included CPAs covered in this report</b>	9956-P1-0001-CP1: 12,540 tCO <sub>2</sub> e 9956-P1-0002-CP1: 20,012 tCO <sub>2</sub> e 9956-P1-0003-CP1: 20,012 tCO <sub>2</sub> e 9956-P1-0004-CP1: 20,012 tCO <sub>2</sub> e 9956-P1-0005-CP1: 20,012 tCO <sub>2</sub> e 9956-P1-0006-CP1: 20,012 tCO <sub>2</sub> e 9956-P1-0007-CP1: 20,012 tCO <sub>2</sub> e 9956-P1-0008-CP1: 20,012 tCO <sub>2</sub> e 9956-P1-0009-CP1: 20,012 tCO <sub>2</sub> e 9956-P1-0010-CP1: 20,012 tCO <sub>2</sub> e 9956-P1-0011-CP1: 20,012 tCO <sub>2</sub> e 9956-P1-0012-CP1: 20,012 tCO <sub>2</sub> e 9956-P1-0013-CP1: 5,336 tCO <sub>2</sub> e 9956-P1-0014-CP1: 5,336 tCO <sub>2</sub> e 9956-P1-0015-CP1: 5,336 tCO <sub>2</sub> e 9956-P1-0016-CP1: 5,336 tCO <sub>2</sub> e 9956-P1-0017-CP1: 5,336 tCO <sub>2</sub> e 9956-P1-0018-CP1: 5,336 tCO <sub>2</sub> e 9956-P1-0019-CP1: 5,336 tCO <sub>2</sub> e 9956-P1-0020-CP1: 4,188 tCO <sub>2</sub> e 9956-P1-0021-CP1: 49 tCO <sub>2</sub> e 9956-P1-0022-CP1: 40 tCO <sub>2</sub> e 9956-P1-0023-CP1: 29 tCO <sub>2</sub> e <b>Total 274,330 tCO<sub>2</sub>e</b>
<b>Name and UNFCCC reference number of the DOE</b>	E-0052: Carbon Check (India) Private Ltd.
<b>Name, position and signature of the approver of the verification and certification report</b>	Amit Anand, CEO 

## SECTION A. Executive summary

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### Introduction:

The Co-ordinating Managing Entity/Project Participant has appointed the DOE, Carbon Check (India) Private Ltd. (CC IPL) to perform an independent verification of the CDM Programme of Activities “Up Energy Improved Cookstove Programme, Uganda” in Uganda (hereafter referred to as “Programme of Activities or PoA”) for the CPAs titled “Up Energy Improved Cookstove Programme, Uganda – CPA No 001”; “Up Energy Improved Cookstove Programme, Uganda – CPA No 002”; “Up Energy Improved Cookstove Programme, Uganda – CPA No 003”; “Up Energy Improved Cookstove Programme, Uganda – CPA No 004”; “Up Energy Improved Cookstove Programme, Uganda – CPA No 005”; “Up Energy Improved Cookstove Programme, Uganda – CPA No 006”; “Up Energy Improved Cookstove Programme, Uganda – CPA No 007”; “Up Energy Improved Cookstove Programme, Uganda – CPA No 008”; “Up Energy Improved Cookstove Programme, Uganda – CPA No 009”; “Up Energy Improved Cookstove Programme, Uganda – CPA No 010”; “Up Energy Improved Cookstove Programme, Uganda – CPA No 011”; “Up Energy Improved Cookstove Programme, Uganda – CPA No 012”; “Up Energy Improved Cookstove Programme, Uganda – CPA No 013”; “Up Energy Improved Cookstove Programme, Uganda – CPA No 014”; “Up Energy Improved Cookstove Programme, Uganda – CPA No 015”; “Up Energy Improved Cookstove Programme, Uganda – CPA No 016”; “Up Energy Improved Cookstove Programme, Uganda – CPA No 017”; “Up Energy Improved Cookstove Programme, Uganda – CPA No 018”; “Up Energy Improved Cookstove Programme, Uganda – CPA No 019”; “Up Energy Improved Cookstove Programme, Uganda – CPA No 020”; “Up Energy Improved Cookstove Programme, Uganda – CPA No 021”; “Up Energy Improved Cookstove Programme, Uganda – CPA No 022” and “Up Energy Improved Cookstove Programme, Uganda – CPA No 023”.

The PoA involves replacement of less efficient cooking stoves using woody biomass with improved cooking stoves (ICS) which are more efficient. The ICS distributed under CPAs of the PoA are more efficient in transferring heat from the fuel to the pot when compared to the stoves typically used in baseline. By replacing inefficient stoves, the PoA will save on consumption of woody biomass.

The CPAs are designed to generate emission reductions by distribution of the fuel-efficient wood / charcoal stoves. The fuel-efficient cook stoves are replacing the less efficient baseline stoves in common use (baseline scenario). The CME and CPA implementer are responsible for the collection of data in accordance with the monitoring plan and the reporting of GHG emissions reductions from the component project activities.

This report summarises the findings of the verification of the project, performed on the basis of paragraph 62 of the CDM Modalities & Procedures, as well as criteria given to provide for consistent project operations, monitoring and reporting and the subsequent decisions by the CDM Executive Board. Verification is required for all registered CDM project activities intending to confirm their achieved emission reductions and proceed with request for issuance of CERs. This report contains the findings and resolutions from the verification and a certification statement for the certified emission reductions.

### Objective:

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

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

The objective of this verification was to verify and certify emission reductions reported for the “Up Energy Improved Cookstove Programme, Uganda” in the host country Uganda for the period 16/08/2019 - 31/01/2020 (inclusive of both the dates).

The purpose of verification is to review the monitoring results and verify that the monitoring was implemented according to the monitoring methodology and the monitoring plan in the PoA-DD /CPA-DDs /B04/ and used to confirm that the reductions in anthropogenic emissions by sources, are sufficient, definitive and presented in a concise and transparent manner. CCIPL’s objective is to perform a thorough, independent assessment of the implementation of the registered programme of activities / CPA-DDs /B04/.

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

Scope:

The scope of the verification is:

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

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

The verification comprises a review of the monitoring report covering the monitoring period from 16/08/2019 - 31/01/2020 and based on the registered/included CPA-DDs including the monitoring plan, emission reduction calculation spreadsheet, monitoring methodology and all related evidence provided by project participant.

Remote stakeholders’ interviews are also performed as part of the verification process.

The verification team assigned by the DOE concludes that the PoA-DD (Version 4.0, dated 30/06/2014) /B04/, CPAs 9956-P1-0001-CP1, 9956-P1-0002-CP1, 9956-P1-0003-CP1, 9956-P1-0004-CP1, 9956-P1-0005-CP1, 9956-P1-0006-CP1, 9956-P1-0007-CP1, 9956-P1-0008-CP1, 9956-P1-0009-CP1, 9956-P1-0010-CP1, 9956-P1-0011-CP1, 9956-P1-0012-CP1, 9956-P1-0013-CP1, 9956-P1-0014-CP1, 9956-P1-0015-CP1, 9956-P1-0016-CP1, 9956-P1-0017-CP1, 9956-P1-0018-CP1, 9956-P1-0019-CP1, 9956-P1-0020-CP1, 9956-P1-0021-CP1, 9956-P1-0022-CP1 and 9956-P1-0023-CP1 as described in the revised and accepted CPA-DDs /B04/ and the monitoring report (version 2.0; dated 22/05/2020) /2/, meets all relevant requirements of the UNFCCC for CDM project activities including article 12 of the Kyoto Protocol and paragraph 62 of CDM M & P, the modalities and procedures for CDM (Marrakesh Accords) and the subsequent decisions by the COP/MOP and CDM Executive Board. The verification has been conducted in-line with the CDM VVS for PoAs requirements Version 02.0 /B01-1/.

The component project activities were correctly implemented according to selected monitoring methodology, monitoring plan and the approved revised CPA-DD/s. The monitoring system was

installed, maintained in a proper manner, while collected monitoring data allowed for the verification of the amount of achieved GHG emission reductions. Through the review and remote interviews, the verification team confirms that the PoA has resulted in 274,330 tCO<sub>2</sub>e emission reductions during the sixth monitoring period in the Monitoring Report number 1.

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

## SECTION B. Verification team, technical reviewer and approver

### B.1. Verification team members

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)	Involvement in			
						Desk/document review	On-site inspection	Interview(s)	Verification findings
1.	Team Leader/ Technical Expert	IR	Singh	Vikash Kumar	CC IPL	X	-	X	X
2.	Local Expert	EI	Muganga	Rogers	CC IPL		-	X	

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

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

## SECTION C. Application of materiality in conducting the verification

### C.1. Consideration of materiality in planning the verification

No.	Risk that could lead to material errors, omissions or misstatements	Assessment of the risk		Response to the risk in the verification plan and/or sampling plan
		Risk level	Justification	
1.	Human Error: Recording and reporting of the information in the ER spreadsheet.	Medium	All the input data in the ER spreadsheet including sales database, determination of parameter for efficiency testing including data calculation. This includes all the parameters to be monitored ex-post as per the PoA-DD/CPA-DDs /B04/.	The risk was mitigated by the training of the personnel involved in the data capture, calculation and by following the monitoring responsibilities. The training records were reviewed which were also confirmed during the remote interviews. Verification team, based on the above, confirms that the risk is appropriately mitigated.
2.	Information System: Use of spreadsheets without adequate controls related to	Medium	The data is recorded in the spreadsheets based on the raw data collected during	The identified risk was mitigated by managing access to the records. It was

	<i>data changes/updates, version tracking, traceability, security</i>		<i>the field visits. The access to the spreadsheets for calculation of ERs, monitoring and sales database and Stove efficiency testing records is controlled.</i>	<i>confirmed through interviews that the raw data is collected by the field personnel and then transmitted and stored electronically to the CME's office. The data quality control is maintained by the CME.</i>
3.	<i>Accuracy of the measuring equipment</i>	<i>Low</i>	<i>Check the calibration records for the measurement equipment used for efficiency test.</i>	<i>The risk due to accuracy of the measuring equipment was ensured by planning to check calibration certificates of the measuring equipment used for stove efficiency (water boiling tests).</i>
4.	<i>Competence of personnel involved in conducting standardized tests viz., WBT</i>	<i>Medium</i>	<i>Interview of the personnel involved and check the training records / accreditation certificates (applicable in case of institutions) involved in conducting such tests.</i>	<i>The risk was mitigated by reviewing the training records of the personnel involved in the conducting such tests and by following the monitoring responsibilities. For institutions involved in conducting such tests their accreditation certificates were checked to establish their competence for conducting such tests. The training records and certificates were reviewed which also confirmed during the interviews.</i>
5.	<i>Sample</i>	<i>Medium</i>	<i>Sample size is suitable and the surveyed households at the CPA level are random.</i>	<i>Cross-check the procedure to identify the sample size against the sampling guideline and standard and confirm the sample size is calculated correctly.</i>

## C.2. Consideration of materiality in conducting the verification

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The threshold of materiality was evaluated based on §13 of "Guideline: Application of materiality in verifications" Version 02.0 /B08/ and §308 of CDM VVS for PoAs, version 02.0 /B01-1/. It was concluded that the materiality threshold applicable to the project activity based on actual emission reductions achieved is 1% of 274,330 tCO<sub>2</sub>e which is equal to 2,743 tCO<sub>2</sub>e.

In planning the verification, verification team took cognizance of §11 and 12 of the "Guideline: Application of materiality in verifications" Version 02.0 /B08/. A materiality threshold of 2,743 tCO<sub>2</sub>e is determined in line with §308 (b) of CDM VVS for PoAs, version 02.0.

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

1. Monitoring system including the data input procedure (including relevant personnel and applicable template forms used)
2. Copy of the agreement between household and Project Participant (s) (origin of data)
3. Stove unique ID system
4. ER sheet (application of data)
5. Data flow
6. Data control procedures
7. Monitoring survey records
8. Stove efficiency test (WBT) records

In conducting the verification, DOE took cognizance of §13-17 of the “Guideline: Application of materiality in verifications” Version 02.0 /B08/ and based on the input of data from different sources checked through sampling of records during remote interviews. Data flow was checked through comparison of data in hand-written forms /5/, electronic database /6/ and ER sheet /4/. The competence of the personnel involved in conducting the stove efficiency testing, recording of data and calculation of the emission reductions data has been checked by the verification team by means of remote interviews.

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

Mitigation of Human error risks: The verification team mitigated the risk by checking the training records of the personnel and assessing their competencies, skills, monitoring / testing procedure followed, understanding of the monitoring survey form / WBT protocol and testing procedure etc. during the remote interviews. Further, data was crosschecked with the ER calculation spreadsheet /4/ and the raw data.

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

Accuracy of the measuring equipment: The risk due to inaccuracy in measurements was mitigated by reviewing calibration certificates of all the project equipment.

Competence of personnel involved in conducting standardized tests viz., WBT: Verification team has reviewed the abilities, qualifications and recognition of involved personnel and institutions of the measuring team involved in the WBT. The WBT has been carried by CIRCODU. The WBT has been carried out by the well-trained personnel and training certificate of the personnel has been provided to the verification team in this respect /10/. The training content /10/ has also been provided to the verification team. The verification team based on remote interviews and review of competency documents /18/ and training records /10/ confirms that the team was qualified to carry out the WBT in line with the protocol.

Mitigation due to error in Sampling: The verification team mitigated the risk by checking the ER sheet /04/ for each CPAs, list of random samples /14/ generated for monitoring surveys for CPAs and sample size calculation sheet /04/ and interviews with personnel responsible for the same.

In conducting the verification, DOE took cognizance of §13-17 of the “Guideline: Application of materiality in verifications” (version 02.0) /B08/ and based on the input of data from different sources checked through sampling of records during remote interviews. Some mistakes were identified and subsequently corrected. These findings are detailed in Appendix 4 and they were successfully closed. Therefore, related identified mistakes as listed in findings in Appendix 4 to this report have been determined to be immaterial. All identified inconsistencies and clarification requests have been successfully closed.

Based on the assessment carried out, CCIPL confirms with a reasonable level of assurance that the claimed emission reductions are free from material errors, omissions or misstatements.

## **SECTION D. Means of verification**

### **D.1. Desk/document review**

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The verification was performed primarily based on the review of the Monitoring report /1/ and the supporting documentation. This process included review of data and information presented to verify their completeness and review of the monitoring plan and monitoring methodology /B02/. Documents reviewed or referenced during the verification are listed in Appendix 3 below.

## D.2. On-site inspection

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On-site visit for the current verification was avoided due to travel restrictions imposed globally due to COVID-19 pandemic impact. DOE also noted CDM EB's decision to relax mandatory site visits by DOEs for a period of three months (23 March 2020 to 23 June 2020) because of COVID-19 /B05/. In view of the notification, DOE could not further postpone the site visit due to the fact that the project participant has a CER delivery commitment from the verification activity as per emission reduction purchase agreement /20/.

The alternative means used for the purpose of verification are demonstrated as follow:

The verification team has carried out remote interviews (by telephone / skype / video calls) in order to assess the information included in the monitoring report and monitoring measurement procedures adopted during the monitoring period. During the desk review, the relevant monitoring records were checked. Previous periodic monitoring reports and verification reports, photographs of the instruments used for WBT, soft copy of original survey records and WBT records were used to cross check consistency of information.

Through the review of validation reports, previous verification reports, comparing the relevant evidence and interview with the CME's representatives through telephone / skype, remote interviews with the house holds sampled by the DOE from the CME's samples, CCIPL has confirmed that the project is implemented in line with the revised and approved PoA-DD/CPA-DDs during the monitoring period. There is no change of the project design, operation and monitoring plan.

Remote interviews were performed by verification team in order to assess the following:

Remote on-site inspection and interviews: 18/05/2020 and 19/05/2020				
No.	Activities performed remotely	Site location	Date	Team member
1.	An assessment of the implementation and operation of the registered project activity as per the registered PoA-DD, CPA-DDs.	Remote interviews	18/05/2020 and 19/05/2020	Vikash Kumar Singh Rogers Muganga
2.	A review of information flows for generating, aggregating and reporting the monitoring parameters	Remote interviews	18/05/2020 and 19/05/2020	Vikash Kumar Singh Rogers Muganga
3.	Interviews with relevant personnel to determine whether the operational and data collection procedures are implemented in accordance with the monitoring plan in the CPA-DD	Remote interviews	18/05/2020 and 19/05/2020	Vikash Kumar Singh Rogers Muganga
4.	A cross check between information provided in the monitoring report and data from other sources such as plant logbooks, inventories, purchase records or similar data sources	Remote interviews	18/05/2020 and 19/05/2020	Vikash Kumar Singh Rogers Muganga
5.	A check of the monitoring equipment including calibration performance and observations of monitoring practices against the requirements of the CPA-DD and the selected methodology and corresponding tool(s), where applicable	Remote interviews	18/05/2020 and 19/05/2020	Vikash Kumar Singh Rogers Muganga
6.	A review of calculations and assumptions made in determining the GHG data and emission reductions	Remote interviews	18/05/2020 and 19/05/2020	Vikash Kumar Singh Rogers Muganga



7.	An identification of quality control and quality assurance procedures in place to prevent or identify and correct any errors or omissions in the reported monitoring parameters	Remote interviews	18/05/2020 and 19/05/2020	Vikash Kumar Singh Rogers Muganga
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## D.3. Interviews

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1.	Lohia	Rohit	Climate-Secure India Pvt. Ltd.	18/05/2020 to 19/05/2020	Project implementation and operation, monitoring procedure, data and information flow, Quality Assurance – Management and operating system, Monitoring records, MR and ER calculation	Vikash Kumar Singh Rogers Muganga
2.	Nihar	-	Climate-Secure India Pvt. Ltd.	18/05/2020 to 19/05/2020	MR and ER calculation	Vikash Kumar Singh Rogers Muganga
3.	Tiwari	Ashutosh	Climate-Secure India Pvt. Ltd.	18/05/2020 to 19/05/2020	MR and ER calculation	Vikash Kumar Singh Rogers Muganga
4.	Krywyj	Yuonne	UpEnergy Uganda	18/05/2020 to 19/05/2020	Project implementation and operation, monitoring procedure, data and information flow, Roles and responsibility, Quality Assurance – Management and operating system, Sales/Distribution records, Survey records, Qualification and Training	Vikash Kumar Singh Rogers Muganga
5.	Wanyaka	Andrew	UpEnergy Uganda	18/05/2020 to 19/05/2020	Project implementation and operation, Sales/Distribution records	Vikash Kumar Singh Rogers Muganga
6.	Anayo	Sheila	UpEnergy Uganda	18/05/2020 to 19/05/2020	Project implementation and operation, Sales/Distribution records	Vikash Kumar Singh Rogers Muganga
7.	Davis	Kintu	CIRCODU	18/05/2020	WBT procedure and records	Vikash Kumar Singh Rogers Muganga
8.	Arineitwe	Joseph Ndemere	CIRCODU	18/05/2020	WBT procedure and records	Vikash Kumar Singh Rogers Muganga
9.	Mubiriu	Julius	Monitoring surveyor	18/05/2020	Monitoring Survey procedure and records	Vikash Kumar Singh Rogers Muganga

**D.4. Sampling approach**

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As assessed in above sections, emission reductions for the twenty three CPAs, (9956-P1-0001-CP1, 9956-P1-0002-CP1, 9956-P1-0003-CP1, 9956-P1-0004-CP1, 9956-P1-0005-CP1, 9956-P1-0006-CP1, 9956-P1-0007-CP1, 9956-P1-0008-CP1, 9956-P1-0009-CP1, 9956-P1-0010-CP1, 9956-P1-0011-CP1, 9956-P1-0012-CP1, 9956-P1-0013-CP1, 9956-P1-0014-CP1, 9956-P1-0015-CP1, 9956-P1-0016-CP1, 9956-P1-0017-CP1, 9956-P1-0018-CP1, 9956-P1-0019-CP1, 9956-P1-0020-CP1, 9956-P1-0021-CP1, 9956-P1-0022-CP1 and 9956-P1-0023-CP1), are being claimed for this monitoring period and the total population of the stoves under these twenty three CPAs are as below:

S.No.	CPA Reference No.	Number of ICS Distributed
1	9956-P1-0001-CP1	11,279
2	9956-P1-0002-CP1	18,000
3	9956-P1-0003-CP1	18,000
4	9956-P1-0004-CP1	18,000
5	9956-P1-0005-CP1	18,000
6	9956-P1-0006-CP1	18,000
7	9956-P1-0007-CP1	18,000
8	9956-P1-0008-CP1	18,000
9	9956-P1-0009-CP1	18,000
10	9956-P1-0010-CP1	18,000
11	9956-P1-0011-CP1	18,000
12	9956-P1-0012-CP1	18,000
13	9956-P1-0013-CP1	15,000
14	9956-P1-0014-CP1	15,000
15	9956-P1-0015-CP1	15,000
16	9956-P1-0016-CP1	15,000
17	9956-P1-0017-CP1	15,000
18	9956-P1-0018-CP1	15,000
19	9956-P1-0019-CP1	15,000
20	9956-P1-0020-CP1	15,000
21	9956-P1-0021-CP1	300
22	9956-P1-0022-CP1	300
23	9956-P1-0023-CP1	285
<b>Total</b>		<b>330,164</b>

The monitoring parameters required to be monitored through the sampling plan are:

1. The thermal efficiency of the ICS distributed (%) ( $\eta_{new}$ )
2. The average usage rate of the appliance ( $U_y$ )
3. The quantity of woody biomass used in the project activity by traditional stoves ( $\mu_{old}$ )

Stratified sampling was applied by the CME for selection of the monitoring samples with 95/10 confidence/precision for cross-CPA sampling for all the parameters which is deemed acceptable as per the registered PoA-DD / CPA-DDs. For the thermal efficiency of the stoves ( $\eta_{new}$ ) and the average usage rate of the appliance ( $U_y$ ), sampling frames were chosen for the respective models of stoves distributed and considered for monitoring separately whereas the quantity of woody biomass used in the project activity by traditional stoves ( $\mu_{old}$ ) sampling frame was chosen for the vintage wise stove distributed (which is in line with the PoA-DD, page 40 where it is stated “A weighted average of stove sales for each vintage will be applied”). Please refer to the section E.3.4.3 of this report on detailed assessment on sampling plan opted by the CME.

As per paragraph 25 of the Sampling Standard, version 08 /B07/, the verification team has to verify whether the project participants or the coordinating/managing entity have implemented the sampling and surveys according to the sampling plan in the registered monitoring plan. The verification includes determining:

- (a) Whether the required confidence/precision has been met;

(b) Whether the selected sample was representative of the population.

In line with paragraph 26 of the Sampling Standard, the verification team has applied a sampling approach for the remote interviews as part of verification. Now as the CME had applied sampling approach, the verification team has chosen acceptance sampling in accordance with paragraph 28 of the sampling standard /B07/.

DOE used sampling during verification for checking the operational status and to check if the WBT tests have been done in the households. Considering that Uganda is a Least Developed Country, applying paragraph 39 (c) of the sampling standard, version 08 /B07/, a sample size of 8 households was chosen (with no discrepant records). A sample size of 8 was determined, based on an AQL of 1.0% and UQL of 20%, producer risk 10% and consumer risk 20%. Acceptance number (c) thus determined for the sample is 0. DOE interviewed 8 samples (each, for monitoring survey and WBTs conducted). It was observed that out of the 8 samples, all the 8 stoves were found to be operational and all the 8 households, where the WBTs were conducted, has confirmed that their stoves were taken by the CME for conducting water boiling tests and they received a new cookstoves as a replacement /12/ and this matched with the CME's records and hence no discrepant records were observed with the published MR /2/ and ER sheet /4/ and thus c=0. Thus, CME's set of records has been accepted in line with § 33 of the sampling standard, version 08 /B07/. Verification team has cross verified these sample documents.

The following table illustrates the agenda covered during the acceptance sampling by the verification team, which is as per Table 1, paragraph 37 of "Standard: Sampling and surveys for CDM project activities and programmes of activities (version 08.0);

Parameter	How the CME conducted sampling surveys (to obtain the project participants' or the coordinating/managing entities' records)	How the DOE could obtain records for verification	Criteria for deciding what ultimately constitutes a discrepancy
% of improved cook stoves (ICS) in operation; Quantity of woody biomass used in the project activity by traditional stoves	Sampling based survey (questionnaire survey/interviews)	Cross-check of a sample of project participants' samples (questionnaire operation surveys/interviews) including but not limited to following: <ul style="list-style-type: none"> <li>• Consistency between the information as contained in Survey sheet and revealed from the off-site interviews</li> <li>• Baseline scenario of the household</li> <li>• Enquire/observe the pre-project/baseline stove/s and its operation during the project scenario.</li> <li>• Enquire/observe parallel use of any other stove and their fuel</li> <li>• Enquire/observe source /storage of fuelwood</li> </ul>	DOE results, accounting for duly justified differences.

		/charcoal or any other fuel • Enquire number of meals cooked (along with family size of household) on project cook stove or any other baseline and/or stoves utilizing other fuel/s.	
Efficiency of improved cook stoves (ICS)	Water Boiling Test as the procedure allowed for efficient test prescribed by applied CDM methodology	Check the test reports/methods; check qualifications/ capabilities of testers;	Whether conducted by qualified institutions/testers; Whether conducted in accordance with approved established international/national standards, procedures and test methods prescribed by applicable CDM methodologies.

The sampling plan implemented by the CME is in accordance with the applied approved monitoring methodology /B02/ and the PoA-DD/CPA-DDs /B04/. The CME has appropriately performed Stratified Sampling procedure in line with the applied methodology. As the registered PoA-DD /B04/ mentions the option for Stratified Sampling procedure, it is acceptable to the verification team.

The necessary confidence / precision of 95/10 each of the parameters are met. This has been cross verified by the verification team from the supporting documents submitted /4/.

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

Areas of verification findings	No. of CL	No. of CAR	No. of FAR
<b>General</b>			
Compliance of the monitoring report with the monitoring report form	-	01	-
Remaining forward action requests from validation and/or previous verifications	-	-	-
CPAs considered for verification and covered in this report	-	-	-
<b>Programme of activities</b>	-	-	-
Compliance of the programme implementation with the registered PoA-DD	-	-	-
Implementation and operation of the management system	-	-	-
Post-registration changes	-	-	-
• Corrections	-	-	-
• Inclusion of a monitoring plan	-	-	-
• Permanent changes to the registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines, or other methodological regulatory documents <sup>1</sup>	-	-	-
• Changes to the programme design	-	-	-
• Addition of CPA inclusion template	-	-	-

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

• Change of coordinating/managing entity	-	-	-
• Changes specific to afforestation and reforestation activities	-	-	-
<b>Component project activities</b>	-	-	-
Compliance of the CPA implementation with the included CPA design document	01	-	-
Post-registration changes	-	-	-
• Temporary deviations from registered monitoring plan, applied methodologies, standardized baselines or other methodological regulatory documents	-	-	-
• Corrections	-	-	-
• Changes to the start date-of the crediting period	-	-	-
• Inclusion of a monitoring plan	-	-	-
• Permanent changes to the registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines, or other methodological regulatory documents	-	-	-
• Changes to the project design	-	-	-
• Changes specific to afforestation and reforestation activities	-	-	-
Compliance of the registered monitoring plan with applied methodologies and standardized baselines	-	-	-
Compliance of monitoring activities with the registered monitoring plan	-	-	-
• Data and parameters fixed ex ante or at renewal of crediting period	-	-	-
• Data and parameters monitored	-	-	-
• Implementation of sampling plan	-	-	-
Compliance with the calibration frequency requirements for measuring instruments	-	-	-
Assessment of data and calculation of emission reductions or net removals	-	-	-
• Calculation of baseline GHG emissions or baseline net GHG removals by sinks	01	-	-
• Calculation of project GHG emissions or actual net GHG removals by sinks	-	-	-
• Calculation of leakage GHG emissions	-	-	-
• Summary of calculation of GHG emission reductions or net GHG removals by sinks	-	-	-
• Comparison of actual GHG emission reductions or net GHG removals by sinks with estimates in included CPA	01	-	-
• Remarks on difference from estimated value in included CPA	-	-	-
Assessment of reported sustainable development co-benefits	-	-	-
Global stakeholder consultation	-	-	-
Others (please specify)	-	-	-
<b>Total</b>	<b>03</b>	<b>01</b>	<b>-</b>

## SECTION E. Verification findings

### E.1. General

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

<b>Means of verification</b>	DR, I
<b>Findings</b>	CAR 01 had been raised and successfully resolved. Please refer to Appendix 4 for further details.

<b>Conclusion</b>	<p>CME has used the Monitoring report form for CDM programme of activities, Version 03.0 /B03/. Verification team confirms that the latest available version of the Monitoring report template /B03/ has been used by the CME and the MR is in compliance of the monitoring report form and instructions therein /B03/.</p> <p>CC IPL, had made the version 1.0, dated 23/04/2020 of the monitoring report /1/, covering the monitoring period from 16/08/2019 to 31/01/2020 (both days inclusive) publicly available on 27/04/2020.</p> <p>This confirms compliance with the §338 and §339 of CDM VVS for PoAs, version 02.0 /B01-1/.</p>
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### E.1.2. Remaining forward action requests from validation and/or previous verifications

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There were 4 forward action requests from validation which were resolved during first periodic verification and there is no FAR from previous (fifth) verification of the PoA.

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

<b>Title and UNFCCC reference number of the CPA included in the PoA as of the end of this monitoring period</b>	<b>Is the CPA considered for this verification? (yes/no)</b>	<b>The date when the CPA was included</b>	<b>Version of the PoA-DD</b>	<b>Confirmation that a request for issuance including the CPA has been published for the previous monitoring period (Y/N)</b>
Up Energy Improved Cookstove Programme, Uganda – CPA No 001; 9956-P1-0001-CP1	Yes	22/07/2014	Version 4.0	Y
Up Energy Improved Cookstove Programme, Uganda – CPA No 002; 9956-P1-0002-CP1	Yes	17/03/2015		Y
Up Energy Improved Cookstove Programme, Uganda – CPA No 003; 9956-P1-0002-CP1	Yes	17/04/2015		Y
Up Energy Improved Cookstove Programme, Uganda – CPA No 004; 9956-P1-0004-CP1	Yes	17/04/2015		Y
Up Energy Improved Cookstove Programme, Uganda – CPA No 005; 9956-P1-0005-CP1	Yes	28/11/2016		Y
Up Energy Improved Cookstove Programme, Uganda – CPA No 006; 9956-P1-0006-CP1	Yes	28/11/2016		Y

Up Energy Improved Cookstove Programme, Uganda – CPA No 007; 9956-P1-0007-CP1	Yes	28/11/2016		Y
Up Energy Improved Cookstove Programme, Uganda – CPA No 008; 9956-P1-0008-CP1	Yes	28/11/2016		Y
Up Energy Improved Cookstove Programme, Uganda – CPA No 009; 9956-P1-0009-CP1	Yes	31/05/2017		Y
Up Energy Improved Cookstove Programme, Uganda – CPA No 010; 9956-P1-0010-CP1	Yes	31/05/2017		Y
Up Energy Improved Cookstove Programme, Uganda – CPA No 011; 9956-P1-0011-CP1	Yes	31/05/2017		Y
Up Energy Improved Cookstove Programme, Uganda – CPA No 012; 9956-P1-0012-CP1	Yes	31/05/2017		Y
Up Energy Improved Cookstove Programme, Uganda – CPA No 013; 9956-P1-0013-CP1	Yes	05/12/2019		Y
Up Energy Improved Cookstove Programme, Uganda – CPA No 014; 9956-P1-0014-CP1	Yes	05/12/2019		Y
Up Energy Improved Cookstove Programme, Uganda – CPA No 015; 9956-P1-0015-CP1	Yes	05/12/2019		Y
Up Energy Improved Cookstove Programme, Uganda – CPA No 016; 9956-P1-0016-CP1	Yes	05/12/2019		Y
Up Energy Improved Cookstove Programme, Uganda – CPA No 017; 9956-P1-0017-CP1	Yes	05/12/2019		Y
Up Energy Improved Cookstove Programme, Uganda – CPA No 018; 9956-P1-0018-CP1	Yes	05/12/2019		Y



Up Energy Improved Cookstove Programme, Uganda – CPA No 019; 9956-P1-0019-CP1	Yes	05/12/2019		Y
Up Energy Improved Cookstove Programme, Uganda – CPA No 020; 9956-P1-0020-CP1	Yes	05/12/2019		Y
Up Energy Improved Cookstove Programme, Uganda – CPA No 021; 9956-P1-0021-CP1	Yes	05/12/2019		Y
Up Energy Improved Cookstove Programme, Uganda – CPA No 022; 9956-P1-0022-CP1	Yes	05/12/2019		Y
Up Energy Improved Cookstove Programme, Uganda – CPA No 023; 9956-P1-0023-CP1	Yes	05/12/2019		Y

## E.2. Programme of activities

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

<b>Means of verification</b>	Document Review, Interview
<b>Findings</b>	-
<b>Conclusion</b>	<p>CC IPL by means of remote interviews and document review, assessed that all physical features (technology, project equipment, and monitoring equipment) of the included CPAs in the registered PoA-DD are in place and that the coordinating/managing entity has operated the PoA and the CPAs as per the registered PoA-DD and the approved revised CPA-DDs.</p> <p>There are no deviations or proposed or actual changes in the implementation or operation of the PoA and the included CPAs.</p> <p>The verification team confirms actual operation of the CPAs and PoA implementation and operation in compliance with the registered PoA-DD / CPA-DDs in order to confirm the compliance of § 340, § 341 and § 342 of CDM VVS for PoAs, Version 02.0 /B01-1/.</p>

### E.2.2. Implementation and operation of the management system

<b>Means of verification</b>	Document Review, Interview
<b>Findings</b>	-
<b>Conclusion</b>	<p>The PoA management system including the record-keeping system has been explained in the registered PoA-DD /B04/. During the course of verification, verification team based on review of provided documents and remote interviews has assessed this management system. Verification team evaluated the management systems in place to implement the monitoring of the project activity. This included the roles and responsibilities of the monitoring staff, data collection, transfer and aggregation procedures, data storage and archiving procedure for the monitoring system.</p> <p>Monitoring surveys were conducted by an external independent consultant /11-2/ and WBTs have been done by a third party, Center for Integrated Research and Community Development Uganda (CIRCODU) /11-1/.</p>

	<p>In order to ensure completeness and accuracy of monitoring information, electronic database is operated and maintained by the CME / CPA implementer. This information is further maintained by the CME, who verifies the reported sales with the number of stoves produced by the manufacturer. The data is further periodically checked by the CME to ensure there is no double counting. This provision for the avoidance of double counting as outlined in the PoA management system has been verified by means of review records of sales database /6/ and remote interviews during the course of verification.</p> <p>It was confirmed during the remote interviews and by checking the monitoring system that all the roles and responsibilities related to monitoring are fulfilled by representatives of CME and the CPA implementer.</p> <p>The responsibilities and authorities for monitoring and reporting are in accordance with the responsibilities and authorities stated in the monitoring plan /B04/.</p> <p>The details about monitoring system have been provided in Section D of the Monitoring report /2/. The data flow and management and reporting structure was also checked during the remote interviews.</p> <p>The verification team confirms that the monitoring management system of the CDM PoA is in place, with the responsibilities properly identified and in place. This confirms the compliance of § 340 (a) and § 347 (b) (iv) of CDM VVS PoAs. Version 02.0 /B01-1/.</p>
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### **E.2.3. Post-registration changes**

#### **E.2.3.1. Corrections**

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There are no corrections applicable to the monitoring period that have been approved by the Board during this monitoring period or to be submitted with the request for issuance.

#### **E.2.3.2. Inclusion of a monitoring plan**

>>

There are no inclusions of monitoring plan to the registered programme of activities has been approved by the Board during this monitoring period.

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

>>

There are no permanent changes to the registered monitoring plan or permanent deviation of the monitoring from the applied methodology during the current monitoring period.

#### **E.2.3.4. Changes to the programme design**

>>

There are no changes to the programme design of the registered PoA-DD.

#### **E.2.3.5. Addition of CPA inclusion template**

>>

Not applicable

#### **E.2.3.6. Change of coordination/managing entity**

>>

Not applicable

**E.2.3.7. Changes specific to afforestation and reforestation activities**

&gt;&gt;

Not applicable

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

<b>Means of verification</b>	Document Review, Interview																																																																		
<b>Findings</b>	CL 01 had been raised and successfully resolved. Please refer to Appendix 4 for further details.																																																																		
<b>Conclusion</b>	<p>The implementation status of the PoA and the component project activities is:</p> <table border="1"> <tr> <td>Co-ordinating and Managing entity/Project Participants:</td><td>UpEnergy Group</td></tr> <tr> <td>Title of the PoA:</td><td>Up Energy Improved Cookstove Programme, Uganda</td></tr> <tr> <td>UNFCCC registration No:</td><td>PoA - 9956</td></tr> <tr> <td>Applied Baseline and monitoring methodology:</td><td>AMS-II.G, Version 05</td></tr> </table> <table border="1"> <tr> <td>Title of the CPA:</td><td>Up Energy Improved Cookstove Programme, Uganda – CPA No 001</td></tr> <tr> <td>CPA reference number:</td><td>9956-P1-0001-CP1</td></tr> <tr> <td>Date of inclusion:</td><td>22/07/2014</td></tr> <tr> <td>CPA implementer</td><td>UpEnergy Uganda Ltd</td></tr> <tr> <td>Project Scale:</td><td>Small scale</td></tr> <tr> <td>Location of the CPA:</td><td>Uganda</td></tr> <tr> <td>CPA crediting period:</td><td>22/07/2014 to 21/07/2021</td></tr> <tr> <td>Reported monitoring Period verified in this verification:</td><td>16/08/2019 - 31/01/2020</td></tr> </table> <table border="1"> <tr> <td>Title of the CPA:</td><td>Up Energy Improved Cookstove Programme, Uganda – CPA No 002</td></tr> <tr> <td>CPA reference number:</td><td>9956-P1-0002-CP1</td></tr> <tr> <td>Date of inclusion:</td><td>17/03/2015</td></tr> <tr> <td>CPA implementer</td><td>UpEnergy Uganda Ltd</td></tr> <tr> <td>Project Scale:</td><td>Small scale</td></tr> <tr> <td>Location of the CPA:</td><td>Uganda</td></tr> <tr> <td>CPA crediting period:</td><td>17/03/2015 to 16/03/2022</td></tr> <tr> <td>Reported monitoring Period verified in this verification:</td><td>16/08/2019 - 31/01/2020</td></tr> </table> <table border="1"> <tr> <td>Title of the CPA:</td><td>Up Energy Improved Cookstove Programme, Uganda – CPA No 003</td></tr> <tr> <td>CPA reference number:</td><td>9956-P1-0003-CP1</td></tr> <tr> <td>Date of inclusion:</td><td>17/04/2015</td></tr> <tr> <td>CPA implementer</td><td>UpEnergy Uganda Ltd</td></tr> <tr> <td>Project Scale:</td><td>Small scale</td></tr> <tr> <td>Location of the CPA:</td><td>Uganda</td></tr> <tr> <td>CPA crediting period:</td><td>17/04/2015 to 16/04/2022</td></tr> <tr> <td>Reported monitoring Period verified in this verification:</td><td>16/08/2019 - 31/01/2020</td></tr> </table> <table border="1"> <tr> <td>Title of the CPA:</td><td>Up Energy Improved Cookstove Programme, Uganda – CPA No 004</td></tr> <tr> <td>CPA reference number:</td><td>9956-P1-0004-CP1</td></tr> <tr> <td>Date of inclusion:</td><td>17/04/2015</td></tr> <tr> <td>CPA implementer</td><td>UpEnergy Uganda Ltd</td></tr> <tr> <td>Project Scale:</td><td>Small scale</td></tr> </table>	Co-ordinating and Managing entity/Project Participants:	UpEnergy Group	Title of the PoA:	Up Energy Improved Cookstove Programme, Uganda	UNFCCC registration No:	PoA - 9956	Applied Baseline and monitoring methodology:	AMS-II.G, Version 05	Title of the CPA:	Up Energy Improved Cookstove Programme, Uganda – CPA No 001	CPA reference number:	9956-P1-0001-CP1	Date of inclusion:	22/07/2014	CPA implementer	UpEnergy Uganda Ltd	Project Scale:	Small scale	Location of the CPA:	Uganda	CPA crediting period:	22/07/2014 to 21/07/2021	Reported monitoring Period verified in this verification:	16/08/2019 - 31/01/2020	Title of the CPA:	Up Energy Improved Cookstove Programme, Uganda – CPA No 002	CPA reference number:	9956-P1-0002-CP1	Date of inclusion:	17/03/2015	CPA implementer	UpEnergy Uganda Ltd	Project Scale:	Small scale	Location of the CPA:	Uganda	CPA crediting period:	17/03/2015 to 16/03/2022	Reported monitoring Period verified in this verification:	16/08/2019 - 31/01/2020	Title of the CPA:	Up Energy Improved Cookstove Programme, Uganda – CPA No 003	CPA reference number:	9956-P1-0003-CP1	Date of inclusion:	17/04/2015	CPA implementer	UpEnergy Uganda Ltd	Project Scale:	Small scale	Location of the CPA:	Uganda	CPA crediting period:	17/04/2015 to 16/04/2022	Reported monitoring Period verified in this verification:	16/08/2019 - 31/01/2020	Title of the CPA:	Up Energy Improved Cookstove Programme, Uganda – CPA No 004	CPA reference number:	9956-P1-0004-CP1	Date of inclusion:	17/04/2015	CPA implementer	UpEnergy Uganda Ltd	Project Scale:	Small scale
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	Location of the CPA:	Uganda
	CPA crediting period:	17/04/2015 to 16/04/2022
	Reported monitoring Period verified in this verification:	16/08/2019 - 31/01/2020
	Title of the CPA:	Up Energy Improved Cookstove Programme, Uganda – CPA No 005
	CPA reference number:	9956-P1-0005-CP1
	Date of inclusion:	28/11/2016
	CPA implementer	UpEnergy Uganda Ltd
	Project Scale:	Small scale
	Location of the CPA:	Uganda
	CPA crediting period:	01/01/2017 to 31/12/2023
	Reported monitoring Period verified in this verification:	16/08/2019 - 31/01/2020
	Title of the CPA:	Up Energy Improved Cookstove Programme, Uganda – CPA No 006
	CPA reference number:	9956-P1-0006-CP1
	Date of inclusion:	28/11/2016
	CPA implementer	UpEnergy Uganda Ltd
	Project Scale:	Small scale
	Location of the CPA:	Uganda
	CPA crediting period:	01/01/2017 to 31/12/2023
	Reported monitoring Period verified in this verification:	16/08/2019 - 31/01/2020
	Title of the CPA:	Up Energy Improved Cookstove Programme, Uganda – CPA No 007
	CPA reference number:	9956-P1-0007-CP1
	Date of inclusion:	28/11/2016
CPA implementer	UpEnergy Uganda Ltd	
Project Scale:	Small scale	
Location of the CPA:	Uganda	
CPA crediting period:	01/01/2017 – 31/12/2023	
Reported monitoring Period verified in this verification:	16/08/2019 - 31/01/2020	
Title of the CPA:	Up Energy Improved Cookstove Programme, Uganda – CPA No 008	
CPA reference number:	9956-P1-0008-CP1	
Date of inclusion:	28/11/2016	
CPA implementer	UpEnergy Uganda Ltd	
Project Scale:	Small scale	
Location of the CPA:	Uganda	
CPA crediting period:	01/01/2017 – 31/12/2023	
Reported monitoring Period verified in this verification:	16/08/2019 - 31/01/2020	
Title of the CPA:	Up Energy Improved Cookstove Programme, Uganda – CPA No 009	
CPA reference number:	9956-P1-0009-CP1	
Date of inclusion:	31/05/2017	
CPA implementer	UpEnergy Uganda Ltd	
Project Scale:	Small scale	
Location of the CPA:	Uganda	
CPA crediting period:	15/07/2017 – 14/07/2024	
Reported monitoring Period verified in this verification:	16/08/2019 - 31/01/2020	
Title of the CPA:	Up Energy Improved Cookstove Programme,	

	Uganda – CPA No 010
CPA reference number:	9956-P1-0010-CP1
Date of inclusion:	31/05/2017
CPA implementer	UpEnergy Uganda Ltd
Project Scale:	Small scale
Location of the CPA:	Uganda
CPA crediting period:	20/08/2017 – 19/08/2024
Reported monitoring Period verified in this verification:	16/08/2019 - 31/01/2020

Title of the CPA:	Up Energy Improved Cookstove Programme, Uganda – CPA No 011
CPA reference number:	9956-P1-0011-CP1
Date of inclusion:	31/05/2017
CPA implementer	UpEnergy Uganda Ltd
Project Scale:	Small scale
Location of the CPA:	Uganda
CPA crediting period:	25/09/2017 –24/09/2024
Reported monitoring Period verified in this verification:	16/08/2019 - 31/01/2020

Title of the CPA:	Up Energy Improved Cookstove Programme, Uganda – CPA No 012
CPA reference number:	9956-P1-0012-CP1
Date of inclusion:	31/05/2017
CPA implementer	UpEnergy Uganda Ltd
Project Scale:	Small scale
Location of the CPA:	Uganda
CPA crediting period:	21/10/2017 –20/10/2024
Reported monitoring Period verified in this verification:	16/08/2019 - 31/01/2020

Title of the CPA:	Up Energy Improved Cookstove Programme, Uganda – CPA No 013
CPA reference number:	9956-P1-0013-CP1
Date of inclusion:	05/12/2019
CPA implementer	UpEnergy Uganda Ltd
Project Scale:	Small scale
Location of the CPA:	Uganda
CPA crediting period:	05/12/2019 –04/12/2026
Reported monitoring Period verified in this verification:	16/08/2019 - 31/01/2020

Title of the CPA:	Up Energy Improved Cookstove Programme, Uganda – CPA No 014
CPA reference number:	9956-P1-0014-CP1
Date of inclusion:	05/12/2019
CPA implementer	UpEnergy Uganda Ltd
Project Scale:	Small scale
Location of the CPA:	Uganda
CPA crediting period:	05/12/2019 –04/12/2026
Reported monitoring Period verified in this verification:	16/08/2019 - 31/01/2020

Title of the CPA:	Up Energy Improved Cookstove Programme, Uganda – CPA No 015
CPA reference number:	9956-P1-0015-CP1
Date of inclusion:	05/12/2019
CPA implementer	UpEnergy Uganda Ltd
Project Scale:	Small scale

	Location of the CPA:	Uganda
	CPA crediting period:	05/12/2019 –04/12/2026
	Reported monitoring Period verified in this verification:	16/08/2019 - 31/01/2020
	Title of the CPA:	Up Energy Improved Cookstove Programme, Uganda – CPA No 016
	CPA reference number:	9956-P1-0016-CP1
	Date of inclusion:	05/12/2019
	CPA implementer	UpEnergy Uganda Ltd
	Project Scale:	Small scale
	Location of the CPA:	Uganda
	CPA crediting period:	05/12/2019 –04/12/2026
	Reported monitoring Period verified in this verification:	16/08/2019 - 31/01/2020
	Title of the CPA:	Up Energy Improved Cookstove Programme, Uganda – CPA No 017
	CPA reference number:	9956-P1-0017-CP1
	Date of inclusion:	05/12/2019
	CPA implementer	UpEnergy Uganda Ltd
	Project Scale:	Small scale
	Location of the CPA:	Uganda
	CPA crediting period:	05/12/2019 –04/12/2026
	Reported monitoring Period verified in this verification:	16/08/2019 - 31/01/2020
	Title of the CPA:	Up Energy Improved Cookstove Programme, Uganda – CPA No 018
	CPA reference number:	9956-P1-0018-CP1
	Date of inclusion:	05/12/2019
CPA implementer	UpEnergy Uganda Ltd	
Project Scale:	Small scale	
Location of the CPA:	Uganda	
CPA crediting period:	05/12/2019 –04/12/2026	
Reported monitoring Period verified in this verification:	16/08/2019 - 31/01/2020	
Title of the CPA:	Up Energy Improved Cookstove Programme, Uganda – CPA No 019	
CPA reference number:	9956-P1-0019-CP1	
Date of inclusion:	05/12/2019	
CPA implementer	UpEnergy Uganda Ltd	
Project Scale:	Small scale	
Location of the CPA:	Uganda	
CPA crediting period:	05/12/2019 –04/12/2026	
Reported monitoring Period verified in this verification:	16/08/2019 - 31/01/2020	
Title of the CPA:	Up Energy Improved Cookstove Programme, Uganda – CPA No 020	
CPA reference number:	9956-P1-0020-CP1	
Date of inclusion:	05/12/2019	
CPA implementer	UpEnergy Uganda Ltd	
Project Scale:	Small scale	
Location of the CPA:	Uganda	
CPA crediting period:	05/12/2019 –04/12/2026	
Reported monitoring Period verified in this verification:	16/08/2019 - 31/01/2020	
Title of the CPA:	Up Energy Improved Cookstove Programme,	

	Uganda – CPA No 021
CPA reference number:	9956-P1-0021-CP1
Date of inclusion:	05/12/2019
CPA implementer	UpEnergy Uganda Ltd
Project Scale:	Small scale
Location of the CPA:	Uganda
CPA crediting period:	05/12/2019 –04/12/2026
Reported monitoring Period verified in this verification:	16/08/2019 - 31/01/2020

Title of the CPA:	Up Energy Improved Cookstove Programme, Uganda – CPA No 022
CPA reference number:	9956-P1-0022-CP1
Date of inclusion:	05/12/2019
CPA implementer	UpEnergy Uganda Ltd
Project Scale:	Small scale
Location of the CPA:	Uganda
CPA crediting period:	05/12/2019 –04/12/2026
Reported monitoring Period verified in this verification:	16/08/2019 - 31/01/2020

Title of the CPA:	Up Energy Improved Cookstove Programme, Uganda – CPA No 023
CPA reference number:	9956-P1-0023-CP1
Date of inclusion:	05/12/2019
CPA implementer	UpEnergy Uganda Ltd
Project Scale:	Small scale
Location of the CPA:	Uganda
CPA crediting period:	05/12/2019 –04/12/2026
Reported monitoring Period verified in this verification:	16/08/2019 - 31/01/2020

As a part of the remote interviews, the verification team was able to confirm that the Programme of activities and the component project activities' implementation are in accordance with the project description contained in the included CPA-DDs /B04/.

The CPAs include distribution of energy efficient improved cooking stoves. The CPA implementer is UpEnergy Uganda Ltd. The portable improved cook stoves (ICS) under the CPAs use charcoal/wood /7/ as fuel. These ICSs are efficient in transferring heat from the fuel to the pot, thus saving charcoal/wood fuel compared to the traditional stoves.

The number of stoves deployed under each CPAs have been confirmed by the monitoring database /6/ and as stated below:

Sl. No.	CPA Reference No.	Number of ICS Distributed
1	9956-P1-0001-CP1	11,279
2	9956-P1-0002-CP1	18,000
3	9956-P1-0003-CP1	18,000
4	9956-P1-0004-CP1	18,000
5	9956-P1-0005-CP1	18,000
6	9956-P1-0006-CP1	18,000
7	9956-P1-0007-CP1	18,000
8	9956-P1-0008-CP1	18,000
9	9956-P1-0009-CP1	18,000
10	9956-P1-0010-CP1	18,000
11	9956-P1-0011-CP1	18,000
12	9956-P1-0012-CP1	18,000
13	9956-P1-0013-CP1	15,000

14	9956-P1-0014-CP1	15,000
15	9956-P1-0015-CP1	15,000
16	9956-P1-0016-CP1	15,000
17	9956-P1-0017-CP1	15,000
18	9956-P1-0018-CP1	15,000
19	9956-P1-0019-CP1	15,000
20	9956-P1-0020-CP1	15,000
21	9956-P1-0021-CP1	300
22	9956-P1-0022-CP1	300
23	9956-P1-0023-CP1	285
Total		330,164

The annual energy savings in GWh<sub>th</sub> for the CPAs for the monitoring period were as follows:

CPA	GWh <sub>th</sub>	Comment
9956-P1-0001-CP1	112.71	In all the cases, energy savings is less than the small-scale threshold of 180 GWh <sub>th</sub> for small scale project
9956-P1-0002-CP1	179.87	
9956-P1-0003-CP1	179.87	
9956-P1-0004-CP1	179.87	
9956-P1-0005-CP1	179.87	
9956-P1-0006-CP1	179.87	
9956-P1-0007-CP1	179.87	
9956-P1-0008-CP1	179.87	
9956-P1-0009-CP1	179.87	
9956-P1-0010-CP1	179.87	
9956-P1-0011-CP1	179.87	
9956-P1-0012-CP1	179.87	
9956-P1-0013-CP1	139.77	
9956-P1-0014-CP1	139.77	
9956-P1-0015-CP1	139.77	
9956-P1-0016-CP1	139.77	
9956-P1-0017-CP1	139.77	
9956-P1-0018-CP1	139.77	
9956-P1-0019-CP1	139.77	
9956-P1-0020-CP1	109.70	
9956-P1-0021-CP1	1.31	
9956-P1-0022-CP1	1.07	
9956-P1-0023-CP1	0.77	

It was confirmed that UpEnergy Group is the Coordinating/Managing Entity for the PoA. The actual component project activity/ies are in line with the approved revised CPA-DDs /B04/. UpEnergy Uganda Ltd is also the CPA implementers for the CPAs.

The information (including data and variables) provided in the MR /2/ is in line with the details provided in the approved revised CPA-DDs /B04/.

This monitoring report /2/ is for the sixth monitoring period (16/08/2019 to 31/01/2020) in the Monitoring Report number 1 for CPA 001 to CPA 023. The reported monitoring report is a first batch to be reported after the the end date of the fifth monitoring period (16/08/2018 to 15/08/2019).

CC IPL's verification team considers the project description of the project contained in the registered PoA-DD and the approved revised CPA-DDs /B04/ to be complete and accurate. The CPA-DDs comply with the relevant methodology, tools, forms and guidance at the time of CPA-DDs submission for registration/inclusion.

In accordance with § 342 of CDM VVS for PoAs, version 02 /B01-1/, the verification team confirms that there is no information (data and variables) in the current monitoring period that are different from that stated in the approved revised CPA-DDs



which has caused an increase in the estimates of GHG emission reductions.

Verification team has assessed the project in order to check any proposed or actual changes to the project design in accordance with § 269 of CDM VVS for PoAs, Version 02.0. In the opinion of CCIPL, there is no change to the project design. CCIPL's verification team confirms that the CPAs are implemented within the boundary of the PoA as described in the registered PoA-DD.

In accordance with § 342 (c) of CDM VVS for PoAs, Version 02.0 /B01-1/, information (data and variables) provided in the monitoring report that are different from that stated in the approved revised CPA-DDs /B04/, have been assessed. The assessment is summarized below:

Parameter	Ex-ante value in the CPA-DDs	Actual operation for the reported monitoring period	Assessment by the verification team
Number of appliances (N <sub>y</sub> )	CPA 1- 14,430; CPA 2- 14,831; CPA 3- 14,831; CPA 4- 14,831; CPA 5- 14,856; CPA 6- 14,831; CPA 7- 14,831; CPA 8- 14,831; CPA 9- 14,831; CPA 10-14,831; CPA 11-14,831; CPA 12-14,831; CPA 13-15,200; CPA 14- 15,200; CPA 15- 15,200; CPA 16- 15,200; CPA 17- 15,200; CPA 18- 15,200; CPA 19- 15,200; CPA 20- 15,200; CPA 21- 15,200; CPA 22- 15,200; CPA 23- 15,200	CPA 1- 11,279; CPA 2- 18,000; CPA 3- 18,000; CPA 4- 18,000; CPA 5- 18,000; CPA 6- 18,000; CPA 7- 18,000; CPA 8- 18,000; CPA 9- 18,000; CPA 10- 18,000; CPA 11-18,000; CPA 12-18,000; CPA 13- 15,000; CPA 14-15,000; CPA 15-15,000; CPA 16-15,000; CPA 17-15,000; CPA 18-15,000; CPA 19-15,000; CPA 20-15,000; CPA 21- 300; CPA 22- 300; CPA 23- 285	<p>Verification team noted that the actual number of cook-stoves distributed under the CPA 2 to CPA 12 are higher than the number indicated in the respective approved revised CPA-DDs /B04/. This difference is acceptable based on the following:</p> <ul style="list-style-type: none"> <li>• CPA-DDs do not restrict the number of cook stoves as the stated values are just indicative values (as explained below);</li> <li>• Energy savings in the CPAs during the monitoring period is less than the threshold limit of 180 GWh<sub>th</sub>/year for small scale project activities.</li> </ul> <p>Verification team further noted that the cook-stove numbers as indicated in the approved revised CPA-DDs is not a fixed number (thus this cannot be categorized under a design change) and this assessment has been based on review of following statement in the CPA-DDs:</p> <p><i>"Though we have calculated the installation cap of this CPA is 14,831 operational ICS per year. Please note that this represents operational stove numbers only and is based on other variables as well which might change ex-post during the crediting period. As long as the CPA does not exceed the 180 GWh<sub>th</sub> energy savings/year threshold, any number of operational stoves</i></p>

				<p>can be added in the CPA. This relation will vary according to the results obtained from the field on the monitoring of the ex-post parameters for each verification period in the specific CPA".</p> <p>The number of cook-stoves stated in the CPA-DDs is only an indicative number based on the small-scale annual energy saving threshold of 180 GWh<sub>th</sub>/year. The verification team noted that with the increase in number of stoves, the CPAs still remain under the limit of small scale and hence this is not deemed as any design change.</p>
	Efficiency of the ICS ( $\eta_{new}$ )	CPA 1- 27.1%; CPA 2- 26.0%; CPA 3- 26.0%; CPA 4- 26.0%; CPA 5- 26.0%; CPA 6- 26.0%; CPA 7- 26.0%; CPA 8- 26.0%; CPA 9- 26.0%; CPA 10- 26.0%; CPA 11- 26.0%; CPA 12- 26.0%; CPA 13 to CPA 23 -34.51%	Weighted average values of 31.16 % for all the CPAs together	<p>The weighted average efficiency of the cook-stoves (<math>\eta_{new}</math>) monitored ex-post for the current monitoring period is slightly higher than the estimated ex-ante values in the CPA-DDs. Verification team noted that the assumed value of thermal efficiency in the CPA-DDs of 26% was only for SmartHome Charcoal stoves and 25.3% for AES model stoves (for AES model stoves the actual monitored thermal efficiency is 23.02% which is less than the CPA-DDs value). This weighted average value is for the 11 different implemented stove models. The CPA-DDs mention the stove models to be distributed are SmartHome Charcoal Stove and the African Energy Stove (AES) as an example. Hence the verification team deemed acceptable the other models of stoves distributed in the CPA-DDs. In actual, the CPA-DDs involve various other models of stoves and their actual monitored efficiencies are less/greater than (for various models) the design values. The verification team confirms that the CME had randomly picked the samples from the different models of the stoves and conducted the WBTs. Hence the WBT results are deemed acceptable.</p>
	Quantity of woody	A value of 0 tonnes/year was	0.58 tonnes/year	The amount of woody biomass consumption that is consumed

	biomass used in the project activity by traditional stoves ( $\mu_{old}$ )	assumed for CPA 1 to CPA 12 and 0.497 for CPA 13 to CPA 23 for ex ante ER estimation		through the continued use of old stoves is based on the actual monitored ex-post value for the current monitoring period. The monitored value is more than the ex-ante estimated ex-ante value in the CPA-DDs which is conservative. As the value is based on the actual monitored values as verified during the remote interviews and survey records, this is deemed acceptable to the verification team.
	Average usage rate of appliance ( $U_y$ )	A value of 1 was assumed for CPA 1 to CPA 12 and 0.95 for CPA 13 to CPA 23 for ex ante ER estimation	84.71%	The average usage rate of the stove is based on the actual monitored ex-post value for the current monitoring period. The monitored value is less than the ex-ante estimated ex-ante value in the CPA-DDs. As the value is based on the actual monitored values as verified during the remote interviews and survey records, this is deemed acceptable to the verification team.
	Emission reductions per stove/year ( $tCO_2$ )	CPA 1- 3.10; CPA 2 to CPA 12- 3.03; CPA 13 to CPA 23- 3.03;	CPA 1 to CPA 12- 2.41; CPA 13 to CPA 19- 0.77; CPA 20- 0.60; CPA 21- 0.35; CPA 22- 0.29; CPA 23- 0.22	The ERs per stove is less than the ex-ante estimated values in the CPA-DDs.
	<p>In the opinion of CCIPL, there is no change to the project design. CCIPL's verification team confirms that the CPAs are implemented within the boundary of the PoA as described in the registered PoA-DD and the implementation and operation of the project activity has been conducted in accordance with the description contained in the registered PoA-DD and approved revised CPA-DDs.</p> <p>The verification team took cognizance of § 340, § 341 and § 342 of the CDM VVS for PoAs, version 02 /B01-1/ to conduct the verification and conducted a site visit in accordance with the § 321 and 322 of the CDM VVS for PoAs, version 02 /B01-1/.</p>			

### E.3.2. Post-registration changes

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

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

#### E.3.2.2. Corrections

>>

There are no corrections made to any CPAs (CPA1 to CPA 23) during the current monitoring period.

PRC for CPA 1 to CPA 4 was approved on 06/09/2018  
[https://cdm.unfccc.int/PoAIssuance/iss\\_db/poaiss960826622/view](https://cdm.unfccc.int/PoAIssuance/iss_db/poaiss960826622/view))  
 PRC for CPA 5 was approved on 03/12/2018  
<https://cdm.unfccc.int/PRCContainer/DB/prcp827754113/view>)  
 PRC for CPA 6 to CPA 12 was approved on 17/09/2019  
<https://cdm.unfccc.int/PRCContainer/DB/prcp614688312/view>).

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

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

#### E.3.2.4. Inclusion of a monitoring plan

>>

There are no inclusions of monitoring plan to included CPA-DDs.

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

>>

There are no permanent changes to the registered monitoring plan or permanent deviation of the monitoring from applied methodologies during the current monitoring period.

PRC for CPA 1 to CPA 4 was approved on 06/09/2018  
[https://cdm.unfccc.int/PoAIssuance/iss\\_db/poaiss960826622/view](https://cdm.unfccc.int/PoAIssuance/iss_db/poaiss960826622/view))  
 PRC for CPA 5 was approved on 03/12/2018  
<https://cdm.unfccc.int/PRCContainer/DB/prcp827754113/view>)  
 PRC for CPA 6 to CPA 12 was approved on 17/09/2019  
<https://cdm.unfccc.int/PRCContainer/DB/prcp614688312/view>).

#### E.3.2.6. Changes to the project design

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There are no changes to the programme design of the included CPA-DDs.

#### E.3.2.7. Changes specific to afforestation and reforestation activities

>>

Not applicable

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

<b>Means of verification</b>	Document Review, Interview
<b>Findings</b>	-
<b>Conclusion</b>	<p>The verification team is able to confirm that the monitoring plan contained in the approved revised CPA-DDs is in accordance with the approved methodology applied by the project activity, i.e. AMS-II. G, version 05 /B02/.</p> <p>The monitoring plan is in accordance with the approved methodology, AMS-II. G, version 05 /B02/, applied by the component project activities and as provided in the CPA-DDs /B04/.</p> <p>The verification took cognizance of § 343 to § 345 of CDM VVS for PoAs, Version 02.0 /B01-1/.</p>

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

The monitoring has been carried out in accordance with the monitoring plan contained in the approved revised CPA-DDs /B04/. This conclusion has been made based on assessment below in section E.3.4.1, E.3.4.2 and E.3.4.3 below.

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

<b>Means of verification</b>	Document Review, Interview
<b>Findings</b>	-
<b>Conclusion</b>	<p>Verification team confirms that the Data and parameters fixed ex ante are in compliance with the approved revised CPA-DDs /B04/ and the monitoring plan. Please refer Appendix 5 for detailed analysis of the ex-ante parameters.</p> <p>The verification took cognizance of § 346 of CDM VVS for PoAs, Version 02.0 /B01-1/.</p>

**E.3.4.2. Data and parameters monitored**

<b>Means of verification</b>	Document Review, Interview
<b>Findings</b>	-
<b>Conclusion</b>	<p>The Verification team confirms that the Data and parameters monitored are in compliance with the approved revised CPA-DDs /B04/ and the monitoring plan /B04/. A complete assessment of each of the monitored parameters has been provided in Appendix 6 of the verification report.</p> <p>The verification took cognizance of § 346, § 347(c), §358 and §359 of CDM VVS for PoAs, Version 02.0 /B01-1/.</p>

**E.3.4.3. Implementation of sampling plan**

Means of verification	Document Review, Interview												
Findings	-												
Conclusion	<p>The total population of the stoves under the twenty-three CPAs considered for the monitoring period is 330,164. The monitoring parameters required to be monitored through the sampling plan are:</p> <ol style="list-style-type: none"><li>1. The thermal efficiency of the ICS distributed (%) (<math>\eta_{new}</math>)</li><li>2. The average usage rate of the appliance (<math>U_y</math>)</li><li>3. The quantity of woody biomass used in the project activity by traditional stoves (<math>\mu_{old}</math>)</li></ol> <p>Cross-CPA stratified sampling was applied for the twenty-three CPAs by CME for selection of the monitoring samples with 95/10 confidence/precision for all the three parameters for annual monitoring which is deemed acceptable as per the registered PoA-DD /CPA-DDs.</p> <p>For the thermal efficiency of the stoves (<math>\eta_{new}</math>) and the average usage rate of the appliance (<math>U_y</math>), sampling frames were chosen for the respective models of stoves distributed and considered for monitoring separately whereas the quantity of woody biomass used in the project activity by traditional stoves (<math>\mu_{old}</math>) sampling frame was chosen for the vintage wise stove distributed.</p> <p>Applying the random number generator, the ICS were randomly picked from the defined population up to the required sample size as calculated by the CME /14/. The verification team confirms that the applied method for sample size calculation is in accordance with the PoA-DD / CPA-DDs /B04/.</p> <p>The number of samples for each of the parameters covered during the monitoring activity is as given below:</p> <table><tr><th>Parameter</th><th>Sample Size required</th><th>(n)</th><th>Samples covered during monitoring</th></tr><tr><td><math>\eta_{new}</math> (AES)</td><td>2</td><td></td><td>2</td></tr><tr><td><math>\eta_{new}</math> (EZY)</td><td>2</td><td></td><td>2</td></tr></table>	Parameter	Sample Size required	(n)	Samples covered during monitoring	$\eta_{new}$ (AES)	2		2	$\eta_{new}$ (EZY)	2		2
Parameter	Sample Size required	(n)	Samples covered during monitoring										
$\eta_{new}$ (AES)	2		2										
$\eta_{new}$ (EZY)	2		2										

$\eta_{\text{new}}$ (SHS)	2	3
$\eta_{\text{new}}$ (SHS-GBE)	2	3
$\eta_{\text{new}}$ (SHS-ILF)	2	2
$\eta_{\text{new}}$ (SHS-BOLD)	3	3
$\eta_{\text{new}}$ (Lugwana)	2	2
$\eta_{\text{new}}$ (Energy Empire)	2	3
$\eta_{\text{new}}$ (BME)	2	3
$\eta_{\text{new}}$ (FSL)	2	2
$\eta_{\text{new}}$ (SpendSmart)	2	3
$U_y$ (AES)	2	4
$U_y$ (EZY)	3	7
$U_y$ (SHS)	6	12
$U_y$ (SHS-GBE)	5	9
$U_y$ (SHS-ILF)	7	18
$U_y$ (SHS-BOLD)	13	18
$U_y$ (Lugwana)	3	10
$U_y$ (Energy Empire)	3	7
$U_y$ (BME)	3	6
$U_y$ (FSL)	2	5
$U_y$ (SpendSmart)	3	4
$\mu_{\text{old}}$ (2013)	2	2
$\mu_{\text{old}}$ (2014)	2	2
$\mu_{\text{old}}$ (2015)	2	2
$\mu_{\text{old}}$ (2016)	2	2
$\mu_{\text{old}}$ (2017)	2	2
$\mu_{\text{old}}$ (2018)	2	4
$\mu_{\text{old}}$ (2019)	4	7
$\mu_{\text{old}}$ (2020)	2	2

The actual sample size in all the cases was not less than either the calculated sample size or the minimum sample size as per the PoA-DD. For the mean parameters, Student's t-distribution has been used since the resulting sample size was less than 30 and this is deemed acceptable in line with the Standard for sampling and surveys for CDM project activities and Programme of Activities, version 08 /B07/.

For the monitoring parameters  $U_y$  and  $\mu_{\text{old}}$ , data were collected following a specially designed survey form. For thermal efficiency of the stoves WBTs (Water Boiling Tests) were conducted.

The verification team has checked and found that for all the parameters the confidence/precision of 95/10 was met.

DOE used sampling during verification for checking the operational status and to check if the WBT tests have been done in the households and it was confirmed that the WBT tests were conducted. Considering that Uganda is a Least Developed Country, applying paragraph 39 (c) of the sampling standard, version 08 /B07/, a sample size of 8 households was chosen (with no discrepant records). A sample size of 8 was required, based on an AQL of 1.0% and UQL of 20%, producer risk 10% and consumer risk 20%. Acceptance number (c) thus determined for the sample is 0. DOE interviewed 8 samples (each, for monitoring survey and WBTs conducted). It was observed that out of the 8 samples, all the 8 stoves were found to be operational and all the 8 households, where the WBTs were conducted, has confirmed that their stoves were taken by the CME for conducting water boiling tests and they received a new cookstoves as a replacement /12/ and this matched with the CME's records and hence no discrepant records were observed with the published MR /2/ and ER sheet /4/ and thus  $c=0$ . Thus, CME's set of records has been accepted in line with § 33 of the sampling standard, version 08 /B07/. Verification team has cross verified these sample documents.

The sampling plan implemented by the CME is in accordance with the applied approved monitoring methodology /B02/ and the PoA-DD/CPA-DDs /B04/. The

	<p>CME has appropriately performed Stratified Random Sampling procedure in line with the applied methodology and best suited for this type of project. As the registered PoA-DD /B04/ mentions the option for Stratified Random Sampling procedure, it is acceptable to the verification team.</p> <p>The necessary confidence / precision of 95/10 each of the parameters is met. This has been cross verified by the verification team from the supporting documents submitted /4/.</p> <p>Please also refer to the assessment provided in Appendix 7 of this report.</p> <p>The verification took cognizance of § 348 of CDM VVS for PoAs, Version 02.0 /B01-1/.</p>
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### E.3.5. Compliance with the calibration frequency requirements for measuring instruments

<b>Means of verification</b>	Document Review, Interview
<b>Findings</b>	-
<b>Conclusion</b>	<p>The stove efficiency testing has been determined by WBTs conducted in line with the guidance provided by the CME in the CPA-DDs /B04/ /15/. The WBTs were conducted by a third party, CIRCODU. During the remote interviews, it was confirmed that the appointed third party has relevant experience and competence in monitoring cookstove projects in Uganda. The monitoring equipment used for conducting the stove efficiencies by WBTs are thermometer, weighing machine and moisture meter. All the monitoring equipment were duly calibrated and hence deemed acceptable /13/. The appropriate QA/QC procedures have been followed for the monitoring parameters.</p> <p>The verification took cognizance of section 10.2.6 of CDM VVS for PoAs, version 02 /B01-1/.</p>

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

In line with the requirement of § 358 and § 359 of CDM VVS for PoAs, Version 02.0 /B01-1/, the verification team has reviewed the Monitoring report /2/ and ER spread sheets /4/ to check the arithmetic calculation of the emission reductions. The equation used for the calculation is compared with those provided in the approved revised CPA-DDs /B04/ and the methodology AMS-II.G, Version 05 /B02/.

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

<b>Means of verification</b>	Document Review, Interview
<b>Findings</b>	CL 02 has been raised. Please refer to Appendix 4 for further details.
<b>Conclusion</b>	<p>The equations for baseline emissions, as provided in the Monitoring report /2/ and confirmed with the approved revised CPA-DDs /B04/ and the methodology AMS-II.G, Version 05 /B02/, are:</p> $ER_y = (B_{y,savings} \times N_y \times U_y) \times (f_{NRB,y} \times NCV_{biomass} \times EF_{projected\_fossilfuel})$ <p>Where:</p> <p><math>ER_y</math> = Emission reductions during the year y in tCO<sub>2</sub>e</p> <p><math>B_{y,savings}</math> = Quantity of biomass that is saved in tonnes per appliance</p> <p><math>f_{NRB,y}</math> = Fraction of biomass saved by the project activity in year y that can be established as non-renewable biomass using survey results, national or local statistics or other sources of information (fixed ex ante as 82%)</p> <p><math>NCV_{biomass}</math> = Net calorific value of the non-renewable biomass that is substituted (IPCC default for wood fuel, 0.015 TJ/tonne)</p> <p><math>EF_{projected\_fossilfuel}</math> = Emission factor for the substitution of non-renewable biomass by similar consumer (Default value of 81.6 tCO<sub>2</sub>/TJ).</p> <p><math>N_y</math> = Number of appliances of the type being deployed during the period y</p>

$U_y$  = Average usage rate (as opposite to drop-off) of appliances of type being deployed during period y as part of the SSC-CPA

$$\text{By savings} = [(B_{\text{old}} - \mu_{\text{old}}) * L] * (1 - \eta_{\text{old}} / \eta_{\text{new}})$$

$B_{\text{old}}$  = Quantity of biomass used in the absence of the project activity in tonnes/year (4.97 as per the CPA-DDs)

$\eta_{\text{old}}$  = Efficiency of the system being replaced (fixed ex ante)

$\eta_{\text{new}}$  = The result obtained from independent testing is used. Efficiency of the system being deployed as part of the project activity (fraction), as determined using the Water Boiling Test (WBT) protocol. Use weighted average values if more than one type of system is being introduced by the project activity. (monitored ex post during the monitoring period)

$L$  = Net to gross Adjustment factor (0.95) applied in accordance with AMS-II.G, ver 05

$\mu_{\text{old}}$  = Quantity of woody biomass for the continued use of old stoves

From the above equation and the parameter values, emission reductions are calculated as:

Specific-case CPA reference number	Emission Reductions (tCO <sub>2</sub> e)
9956-P1-0001-CP1	12,540
9956-P1-0002-CP1	20,012
9956-P1-0003-CP1	20,012
9956-P1-0004-CP1	20,012
9956-P1-0005-CP1	20,012
9956-P1-0006-CP1	20,012
9956-P1-0007-CP1	20,012
9956-P1-0008-CP1	20,012
9956-P1-0009-CP1	20,012
9956-P1-0010-CP1	20,012
9956-P1-0011-CP1	20,012
9956-P1-0012-CP1	20,012
9956-P1-0013-CP1	5,336
9956-P1-0014-CP1	5,336
9956-P1-0015-CP1	5,336
9956-P1-0016-CP1	5,336
9956-P1-0017-CP1	5,336
9956-P1-0018-CP1	5,336
9956-P1-0019-CP1	5,336
9956-P1-0020-CP1	4,188
9956-P1-0021-CP1	49
9956-P1-0022-CP1	40
9956-P1-0023-CP1	29
<b>Total</b>	<b>274,330</b>

The verification team confirms that the calculation of baseline emission and emission reductions is in accordance with the applied methodological equation and the approved revised CPA-DDs. Calculations have been checked and confirmed from the ER spread sheet /4/.

The verification took cognizance of § 358 of CDM VVS for PoAs, version 02.0 /B01-



1/.

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

<b>Means of verification</b>	Document Review, Interview
<b>Findings</b>	-
<b>Conclusion</b>	There are no project emissions identified in the monitoring methodology /B02/ and the CPA-DDs /B04/.

**E.3.6.3. Calculation of leakage GHG emissions**

<b>Means of verification</b>	Document Review, Interview
<b>Findings</b>	-
<b>Conclusion</b>	<p>Net-to-gross adjustment factors for leakage (fixed default values of 0.95 as per AMS II.G. version 05) /B02/ was applied to the project activity to calculate Emission Reductions of this Monitoring Period.</p> <p>Verification team confirms that all parameters are used correctly in the calculations, all results are verifiable and transparent, all assumptions are described and based on verifiable evidence and calculations are done in accordance with the pre-defined formulae from approved revised CPA-DDs /B04/.</p>

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

<b>Means of verification</b>	Document Review, Interview
<b>Findings</b>	-
<b>Conclusion</b>	<p>The verification team confirms that all parameters are used correctly in the calculations, all results are verifiable and transparent, all assumptions are described and based on verifiable evidence and calculations are done in accordance with the pre-defined formulae from approved revised CPA-DDs. The total number of ERs achieved during the monitoring period is 274,330 tCO<sub>2</sub>e.</p> <p>In summary, verification team confirms that actual emission reduction is lower than the estimate of the approved revised CPA-DDs /B04/ for the current monitoring period.</p> <p>The verification took cognizance of § 358 of CDM VVS PoAs, version 02 /B01-1/.</p>

CPA UNFCCC reference number	Baseline GHG emissions or baseline net GHG removals (t CO <sub>2</sub> e)	Project GHG emissions or actual net GHG removals (t CO <sub>2</sub> e)	Leakage GHG emissions (t CO <sub>2</sub> e)	GHG emission reductions or net anthropogenic GHG removals (t CO <sub>2</sub> e)		
				Before 01/01/2013	From 01/01/2013	Total amount
9956-P1-0001-CP1	12,540	-	-	0	12,540	12,540
9956-P1-0002-CP1	20,012	-	-	0	20,012	20,012
9956-P1-0003-CP1	20,012	-	-	0	20,012	20,012
9956-P1-0004-CP1	20,012	-	-	0	20,012	20,012
9956-P1-0005-CP1	20,012	-	-	0	20,012	20,012
9956-P1-0006-CP1	20,012	-	-	0	20,012	20,012
9956-P1-0007-CP1	20,012	-	-	0	20,012	20,012
9956-P1-0008-CP1	20,012	-	-	0	20,012	20,012
9956-P1-0009-CP1	20,012	-	-	0	20,012	20,012
9956-P1-0010-CP1	20,012	-	-	0	20,012	20,012
9956-P1-0011-CP1	20,012	-	-	0	20,012	20,012
9956-P1-0012-CP1	20,012	-	-	0	20,012	20,012

9956-P1-0013-CP1	5,336	-	-	0	5,336	5,336
9956-P1-0014-CP1	5,336	-	-	0	5,336	5,336
9956-P1-0015-CP1	5,336	-	-	0	5,336	5,336
9956-P1-0016-CP1	5,336	-	-	0	5,336	5,336
9956-P1-0017-CP1	5,336	-	-	0	5,336	5,336
9956-P1-0018-CP1	5,336	-	-	0	5,336	5,336
9956-P1-0019-CP1	5,336	-	-	0	5,336	5,336
9956-P1-0020-CP1	4,188	-	-	0	4,188	4,188
9956-P1-0021-CP1	49	-	-	0	49	49
9956-P1-0022-CP1	40	-	-	0	40	40
9956-P1-0023-CP1	29	-	-	0	29	29
<b>Total</b>	<b>274,330</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>274,330</b>	<b>274,330</b>

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

<b>Means of verification</b>	Document Review
<b>Findings</b>	CL 03 had been raised and successfully resolved. Please refer to Appendix 4 for further details.
<b>Conclusion</b>	Comparison of the actual GHG emission reductions with the estimates in the included specific CPAs is given in the below table. The verification team took cognizance of § 358 of CDM VVS for PoAs, version 02 /B01-1/.

CPA UNFCCC reference number	Amount achieved during this monitoring period (t CO <sub>2</sub> e)	Amount estimated ex ante (t CO <sub>2</sub> e)
9956-P1-0001-CP1	12,540	20,721
9956-P1-0002-CP1	20,012	20,769
9956-P1-0003-CP1	20,012	20,769
9956-P1-0004-CP1	20,012	20,769
9956-P1-0004-CP1	20,012	20,769
9956-P1-0006-CP1	20,012	20,769
9956-P1-0007-CP1	20,012	20,769
9956-P1-0008-CP1	20,012	20,769
9956-P1-0009-CP1	20,012	20,769
9956-P1-0010-CP1	20,012	20,769
9956-P1-0011-CP1	20,012	20,769
9956-P1-0012-CP1	20,012	20,769
9956-P1-0013-CP1	5,336	6,527
9956-P1-0014-CP1	5,336	6,527
9956-P1-0015-CP1	5,336	6,527
9956-P1-0016-CP1	5,336	6,527
9956-P1-0017-CP1	5,336	6,527
9956-P1-0018-CP1	5,336	6,527
9956-P1-0019-CP1	5,336	6,527
9956-P1-0020-CP1	4,188	6,527
9956-P1-0021-CP1	49	6,527
9956-P1-0022-CP1	40	6,527

9956-P1-0023-CP1	29	6,527
<b>Total</b>	<b>274,330</b>	<b>320,979</b>

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

<b>Means of verification</b>	Document review
<b>Findings</b>	-
<b>Conclusion</b>	The actual emission reductions are less than the ex-ante estimated values in the CPA-DDs.

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

<b>Means of verification</b>	Not applicable (as there are no sustainable development co-benefits required as per the registered CDM PoA-DD)
<b>Findings</b>	-
<b>Conclusion</b>	Not applicable The verification took cognizance of § 361 of CDM VVS PoAs, version 02 /B01-1/.

**E.3.8. Global stakeholder consultation**

<b>Means of verification</b>	Not applicable (as this is not first Monitoring report)
<b>Findings</b>	-
<b>Conclusion</b>	Not applicable (this is not first Monitoring report) The verification took cognizance of § 370 of CDM VVS PoAs, version 02 /B01-1/.

**SECTION F. Internal quality control**

&gt;&gt;

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

**SECTION G. Verification opinion**

&gt;&gt;

Carbon Check (India) Private Ltd. has performed the sixth periodic verification in the Monitoring Report number 1 of the registered CDM Programme of Activities "Up Energy Improved Cookstove Programme, Uganda" in Uganda (hereafter referred to as "Programme of Activities or PoA") for the CPAs titled "Up Energy Improved Cookstove Programme, Uganda – CPA No 001"; "Up Energy Improved Cookstove Programme, Uganda – CPA No 002"; "Up Energy Improved Cookstove Programme, Uganda – CPA No 003"; "Up Energy Improved Cookstove Programme, Uganda – CPA No 004"; "Up Energy Improved Cookstove Programme, Uganda – CPA No 005"; "Up Energy Improved Cookstove Programme, Uganda – CPA No 006"; "Up Energy Improved Cookstove Programme, Uganda – CPA No 007"; "Up Energy Improved Cookstove Programme, Uganda – CPA No 008"; "Up Energy Improved Cookstove Programme, Uganda – CPA No 009"; "Up Energy Improved Cookstove Programme, Uganda – CPA No 010"; "Up Energy Improved Cookstove Programme, Uganda – CPA No 011"; "Up Energy Improved Cookstove Programme, Uganda – CPA No 012"; "Up Energy Improved Cookstove Programme, Uganda – CPA No 013"; "Up Energy Improved Cookstove Programme, Uganda – CPA No 014"; "Up Energy Improved Cookstove Programme, Uganda – CPA No 015"; "Up Energy Improved Cookstove Programme, Uganda – CPA No 016"; "Up Energy Improved Cookstove Programme, Uganda – CPA No 017"; "Up Energy Improved Cookstove Programme, Uganda – CPA No 018"; "Up Energy Improved Cookstove Programme, Uganda – CPA No 019"; "Up Energy Improved Cookstove Programme, Uganda – CPA No 020"; "Up Energy Improved Cookstove Programme, Uganda – CPA No 021"; "Up Energy Improved Cookstove Programme, Uganda – CPA No 022" and "Up Energy Improved Cookstove Programme, Uganda – CPA No 023".

The verification team assigned by the DOE concludes that the PoA-DD (Version 4.0, dated 30/06/2014), CPAs 9956-P1-0001-CP1, 9956-P1-0002-CP1, 9956-P1-0003-CP1, 9956-P1-0004-CP1, 9956-P1-0005-CP1, 9956-P1-0006-CP1, 9956-P1-0007-CP1, 9956-P1-0008-CP1, 9956-P1-0009-CP1, 9956-P1-0010-CP1, 9956-P1-0011-CP1, 9956-P1-0012-CP1, 9956-P1-0013-CP1, 9956-P1-0014-CP1, 9956-P1-0015-CP1, 9956-P1-0016-CP1, 9956-P1-0017-CP1, 9956-P1-0018-CP1, 9956-P1-0019-CP1, 9956-P1-0020-CP1, 9956-P1-0021-CP1, 9956-P1-0022-CP1 and 9956-P1-0023- as described in the revised and accepted CPA-DDs /B04/ and the Monitoring report (Version 2.0, dated 22/05/2020) /2/, meet all relevant requirements of the UNFCCC for CDM project activities including article 12 of the Kyoto Protocol and paragraph 62 of CDM M& P, the modalities and procedures for CDM (Marrakesh Accords) and the subsequent decisions by the COP/MOP and CDM Executive Board. The verification has been conducted in-line with the CDM VVS for programme of activities requirements version 02.0 /B01-1/.

Verification methodology and process:

The Verification team confirms the contractual relationship signed on 24/03/2020 between the DOE, Carbon Check (India) Private Ltd. and the Co-ordinating Managing Entity/ Project Participant, (UpEnergy Group). The team assigned to the verification meets the Carbon Check (India) Private Ltd.'s internal procedures including the UNFCCC requirements for the team composition and competence. The verification team has conducted a thorough contract review as per UNFCCC and Carbon Check's procedures and requirements.

The verification is being performed as per the requirements described in the CDM VVS for PoAs, version 02.0 /B01-1/ and constitutes the review and completion of the following steps:

- Reviewing the approved revised / registered PoA-DD (Version 4.0, date 30/06/2014), the approved revised CPA DDs for 9956-P1-0001-CP1, 9956-P1-0002-CP1, 9956-P1-0003-CP1, 9956-P1-0004-CP1, 9956-P1-0005-CP1, 9956-P1-0006-CP1, 9956-P1-0007-CP1, 9956-P1-0008-CP1, 9956-P1-0009-CP1, 9956-P1-0010-CP1, 9956-P1-0011-CP1, 9956-P1-0012-CP1, 9956-P1-0013-CP1, 9956-P1-0014-CP1, 9956-P1-0015-CP1, 9956-P1-0016-CP1, 9956-P1-0017-CP1, 9956-P1-0018-CP1, 9956-P1-0019-CP1, 9956-P1-0020-CP1, 9956-P1-0021-CP1, 9956-P1-0022-CP1 and 9956-P1-0023-CP1 (/B04/), including the monitoring plan and the corresponding validation report/s /B04/;
- Previous verification and certification reports and the monitoring reports for the previous monitoring periods /B09/;
- Publication of the MR on the UNFCCC website (version 1.0, 23/04/2020) on 27/04/2020
- Desk review of the validation report, MR and other relevant documents including documents related to the project activities in emission reductions
- Review of the applied monitoring methodology (AMS-II.G, version 05);
- Review of any CMP and EB decisions, clarifications and guidance;
- Remote assessment interviews (18/05/2020-19/05/2020)
- Resolution of CARs and CLs raised during verification (to be done)
- Issuance of Verification Report

The component project activities were correctly implemented according to the selected monitoring methodology, monitoring plan and the approved revised CPA-DDs. The monitoring system was installed, maintained in a proper manner, while collected monitoring data allowed for the verification of the amount of achieved GHG emission reductions. Through the review and remote interviews, the verification team confirms that the PoA has resulted in the 274,330 tCO<sub>2</sub>e emission reductions during the sixth monitoring period for the first batch of CPAs (CPA 1 – CPA 23).

Verified emission reductions:

Specific-case CPA reference number	Emission Reductions (tCO <sub>2</sub> e)
9956-P1-0001-CP1	12,540
9956-P1-0002-CP1	20,012

	CDM-PoA-VCR-FORM
9956-P1-0003-CP1	20,012
9956-P1-0004-CP1	20,012
9956-P1-0005-CP1	20,012
9956-P1-0006-CP1	20,012
9956-P1-0007-CP1	20,012
9956-P1-0008-CP1	20,012
9956-P1-0009-CP1	20,012
9956-P1-0010-CP1	20,012
9956-P1-0011-CP1	20,012
9956-P1-0012-CP1	20,012
9956-P1-0013-CP1	5,336
9956-P1-0014-CP1	5,336
9956-P1-0015-CP1	5,336
9956-P1-0016-CP1	5,336
9956-P1-0017-CP1	5,336
9956-P1-0018-CP1	5,336
9956-P1-0019-CP1	5,336
9956-P1-0020-CP1	4,188
9956-P1-0021-CP1	49
9956-P1-0022-CP1	40
9956-P1-0023-CP1	29
<b>Total</b>	<b>274,330</b>

The break-up of emission reduction up to 31<sup>st</sup> December 2012 and 1<sup>st</sup> January 2013 onwards as verified during the course of verification are as below:

Item	Emission reductions up to 31 December 2012	Emission reductions from 1 January 2013 onwards
Emission reductions (t CO <sub>2</sub> e)	0	274,330

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

## SECTION H. Certification statement

>>

Carbon Check (India) Private Ltd., the DOE, has performed the verification of the registered Programme of Activities, UNFCCC Registration Number 9956, "Up Energy Improved Cookstove Programme, Uganda" in Uganda. The PoA involves replacement of less efficient cooking stoves using woody biomass with ICS which are more efficient. The ICS distributed under CPAs of the PoA are more efficient in transferring heat from the fuel to the pot when compared to the stoves typically used in baseline. By replacing inefficient stoves, the PoA will save on consumption of woody biomass (either wood or charcoal made of wood).

The component project activities of the Programme of Activities are designed to generate emission reductions by distribution of the fuel-efficient charcoal / wood fuel-based cook stoves in Uganda. The CME and CPA implementer are responsible for the collection of data in accordance with the monitoring plan and the reporting of GHG emissions reductions from the component project activity/ies. It is DOE's responsibility to express an independent verification statement on the reported GHG emission reductions from the component project/s. The DOE does not express any

opinion on the selected baseline scenario or on the validated and registered PoA-DD/CPA-DD. The verification is carried out in-line with the VVS requirements.

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

The verification is based on:

- PoA-DD Version 4.0 dated 30/06/2014;
- CPA-DD/s included in the registered PoA and its monitoring plan for the monitoring period 16/08/2019 - 31/01/2020.
- Approved monitoring methodology AMS-II.G “Energy efficiency measures in thermal applications of non-renewable biomass”, Version 05;
- Validation report /B04/ for the PoA and the CPA/s;
- Monitoring reports Version 1.0 and 2.0 dated 23/04/2020 and 22/05/2020 respectively.

This statement covers verification period from 16/08/2019 - 31/01/2020 (both dates included).

The DOE had raised 03 clarification and 01 corrective action requests, all of which have been resolved by the CME.

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

The DOE, hereby certifies that the project activity, achieved emission reductions by sources of GHG equal to 274,330 tCO<sub>2</sub>e and all monitoring requirements have been fulfilled and is substantiated by an audit trail that contains evidence and records. The break-up of emission reduction up-to 31/12/2012 and 01/01/2013 onwards as verified during the course of verification are as below:

Item	Emission reductions up to 31 December 2012	Emission reductions from 1 January 2013 onwards
Emission reductions (t CO <sub>2</sub> e)	0	274,330

## Appendix 1. Abbreviations

Abbreviations	Full texts
AQL	Acceptable Quality Limit
CDM	Clean Development Mechanism
CER	Certified Emission Reduction
CAR	Corrective Action Request
CC IPL	Carbon Check (India) Private Ltd.
CER	Certified Emission Reduction
CIRCODU	Center for Integrated Research and Community Development Uganda
CL	Clarification Request
CME	Co-ordinating and Managing entity
CPA	Component Project Activity
CPA-DD	Component Project Activity Design Document
CO <sub>2</sub>	Carbon Dioxide
CO <sub>2</sub> e	Carbon Dioxide Equivalent
DR	Document review
DOE	Designated Operational Entities
DVR	Draft Verification Report
EB	CDM Executive Board
EF	Emission Factor
EI	External individual
FA	Final Approval
FAR	Forward Action Request
FVR	Final verification Report
GACC	Global Alliance for Clean Cookstoves
GHG	Greenhouse gas(es)
GWh	Giga Watt Hour
I	Interview
IPCC	Intergovernmental Panel on Climate Change
IR	Internal resource
MP	Monitoring Period
MWh	Mega Watt Hour
MR	Monitoring Report
PoA	Programme of Activities
PoA-DD	Programme of Activities Design Document
PP	Project Participant
QC/QA	Quality control /Quality assurance
TA	Technical Area
TR	Technical Review
UNFCCC	United Nations Framework Convention on Climate Change
UQL	Unacceptable Quality Limit
VVS	Validation and Verification Standard
WBT	Water boiling test



## Appendix 2. Competence of team members and technical reviewers



**Carbon Check (India) Private Ltd.**

**Vikash Kumar Singh**

has been qualified as per CCIPL's internal qualification procedures, in accordance with requirements of Accreditation Standard (version 07.0):

*For following functions:*

Validator	<input checked="" type="checkbox"/>	Team Leader	<input checked="" type="checkbox"/>	Technical reviewer	<input checked="" type="checkbox"/>
Verifier	<input checked="" type="checkbox"/>	Technical Expert	<input checked="" type="checkbox"/>	Local Expert <sup>1</sup>	<input checked="" type="checkbox"/>

*In the following Technical Areas:*

TA 1.1	<input checked="" type="checkbox"/>	TA 3.1	<input checked="" type="checkbox"/>	TA 5.2	<input type="checkbox"/>	TA 9.2	<input type="checkbox"/>	TA 13.2	<input checked="" type="checkbox"/>
TA 1.2	<input checked="" type="checkbox"/>	TA 4.1	<input checked="" type="checkbox"/>	TA 8.1	<input type="checkbox"/>	TA 10.1	<input type="checkbox"/>	TA 14.1	<input type="checkbox"/>
TA 2.1	<input type="checkbox"/>	TA 5.1	<input type="checkbox"/>	TA 9.1	<input type="checkbox"/>	TA 13.1	<input checked="" type="checkbox"/>		

**Mr. Amit Anand**  
CEO

**Date of Approval**  
24/12/2019

**Valid Till**  
23/12/2020

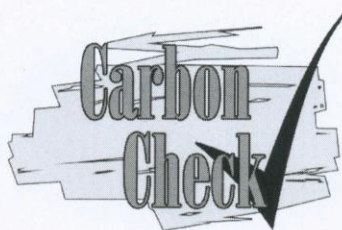
### Revision History of the Document

26/12/2014	Initial Adoption
24/12/2015	Annual Revision
20/01/2016	Interim Revision for office address change
23/12/2016	Annual Revision
24/12/2017	Annual Revision
24/12/2018	Annual Revision
24/12/2019	Annual Revision

<sup>1</sup> India, South Africa

**CARBON CHECK (INDIA) PRIVATE LIMITED**  
Registered in India: U74930DL2012PTC232495  
Regd. Off: 2071/38, 2<sup>nd</sup> Floor, Naiwala, Karol Bagh, New Delhi - 110005  
Corporate off: G 49 & 50, 3<sup>rd</sup> Floor, Sector - 3, NOIDA (Uttar Pradesh) - 201301  
Tel: +91 120 4373114 | URL: [www.carboncheck.co.in](http://www.carboncheck.co.in)  
e-mail: [info@carboncheck.co.in](mailto:info@carboncheck.co.in)





## Carbon Check (India) Private Ltd.

### Amit Anand

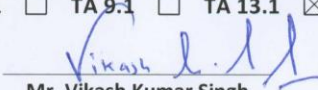
has been qualified as per CCIPL's internal qualification procedures, in accordance with requirements of Accreditation Standard (version 07.0):

For following functions:

Validator	<input checked="" type="checkbox"/>	Team Leader	<input checked="" type="checkbox"/>	Technical reviewer	<input checked="" type="checkbox"/>
Verifier	<input checked="" type="checkbox"/>	Technical Expert	<input checked="" type="checkbox"/>	Local Expert <sup>1</sup>	<input checked="" type="checkbox"/>

In the following Technical Areas:

TA 1.1	<input checked="" type="checkbox"/>	TA 3.1	<input checked="" type="checkbox"/>	TA 5.2	<input type="checkbox"/>	TA 9.2	<input type="checkbox"/>	TA 13.2	<input type="checkbox"/>
TA 1.2	<input checked="" type="checkbox"/>	TA 4.1	<input type="checkbox"/>	TA 8.1	<input checked="" type="checkbox"/>	TA 10.1	<input type="checkbox"/>	TA 14.1	<input checked="" type="checkbox"/>
TA 2.1	<input type="checkbox"/>	TA 5.1	<input type="checkbox"/>	TA 9.1	<input type="checkbox"/>	TA 13.1	<input checked="" type="checkbox"/>		

  
Mr. Vikash Kumar Singh  
Compliance Officer

Date of Approval  
24/12/2019

Valid Till  
23/12/2020

#### Revision History of the Document

26/12/2014	Initial Adoption
24/12/2015	Annual Revision
20/01/2016	Interim Revision for office address change
23/12/2016	Annual Revision
24/12/2017	Annual Revision
24/12/2018	Annual Revision
24/12/2019	Annual Revision

<sup>1</sup> India, South Africa

CARBON CHECK (INDIA) PRIVATE LIMITED  
Registered in India: U74930DL2012PTC232495  
Regd. Off: 2071/38, 2<sup>nd</sup> Floor, Naiwala, Karol Bagh, New Delhi - 110005  
Corporate off: G 49 & 50, 3<sup>rd</sup> Floor, Sector - 3, NOIDA (Uttar Pradesh) - 201301  
Tel: +91 120 4373114 | URL: [www.carboncheck.co.in](http://www.carboncheck.co.in)  
e-mail: [info@carboncheck.co.in](mailto:info@carboncheck.co.in)

### Appendix 3. Documents reviewed or referenced

No.	Author	Title	References to the document	Provider
1	UpEnergy	- Webhosted Monitoring report	Version 1.0, dated 23/04/2020	CME
2	UpEnergy	Final Monitoring report	Version 2.0, dated 22/05/2020	CME
3	UpEnergy	Emission reduction calculation spread sheets for the twenty three CPAs corresponding to /1/	Version 1.0, dated 23/04/2020	CME
4	UpEnergy	Emission reduction calculation spread sheets for the twenty three CPAs corresponding to /2/	Version 2.0, dated 22/05/2020	CME
5	UpEnergy	Survey records for the monitoring period (for $U_y$ and $\mu_{old}$ )	-	CME
6	UpEnergy	CPA distribution records including evidence for the dates of distribution	-	CME
7	UpEnergy	Stove specifications for EZY, SHS, AES, SHS-GBE, SHS-BOLD, SHS-ILF, Lugwana, SpendSmart, Energy Empire, BME and FSL models used under the monitoring period	-	CME
8	UpEnergy	Proof of Carbon Credits waiver by End user	-	CME
9	UpEnergy	Sample stoves sales receipt / user agreement	-	CME
10	UpEnergy	Training records of CIRCODU / Surveying personnel on the following aspect: <ul style="list-style-type: none"> <li>• Conducting of the monitoring survey using the questionnaire</li> <li>• Checking of the quantity of fuel usage in each of the sampled households for the use of traditional stove</li> <li>• Handling and use of measuring instruments</li> <li>• Conducting water boiling tests using WBT Protocol version 4.2.3</li> <li>• Data recording</li> </ul>		CME
11	UpEnergy	1. Copy of contract in between UpEnergy and CIRCODU for conducting WBTs 2. Copy of contract in between Upenergy and external independent consultant for conducting Surveys		
12	UpEnergy	1. Water boiling test records (calculation spread sheets and original data sheet) 2. Records of the stoves on which WBT was conducted including the replacement stoves provided to the end users	-	CME
13	UpEnergy	Calibration certificate for each of the monitoring equipment (thermometer, weighing scale, Moisture meter)	-	CME
14	UpEnergy	Evidence for random number generator for sampling	-	CME
15	UpEnergy	WBT conducting methodology for the cook stoves	-	CME
16	UpEnergy	Agreement copy in between the CME and UpEnergy Uganda Ltd (CPA implementer)	-	CME
17	UpEnergy	CME Manual for the PoA along with Organization Structure	-	CME
18	CIRCODU	Competence of the persons who conducted monitoring	-	CME
19	UpEnergy	Copies of the contracts with stove	-	CME

		manufacturers		
20	UpEnergy	Emission Reduction Purchase Agreement		CME
B01	UNFCCC	1.Validation and Verification Standard for PoAs, version 02 2.Project Standard for PoAs, version 2 3.Project Cycle Procedure for PoAs, version 02	<a href="http://cdm.unfccc.int/">http://cdm.unfccc.int/</a>	Others
B02	UNFCCC	Applied baseline and monitoring methodology, AMS-II.G, version 05.0	<a href="http://cdm.unfccc.int/">http://cdm.unfccc.int/</a>	Others
B03	UNFCCC	Instructions for filling out the monitoring report form for CDM programme of activities, version 03.0	<a href="http://cdm.unfccc.int/">http://cdm.unfccc.int/</a>	Others
B04	UNFCCC	Registered PoA-DD (Version 4.0 dated 30/06/2014), (CPA-DD for 9956-P1-0001-CP1: Version 06 date 17/05/2018; 9956-P1-0002-CP1: Version 05 dated 17/05/2018; 9956-P1-0003-CP1: Version 04 dated 17/05/2018; 9956-P1-0004-CP1; Version 04 dated 17/05/2018, 9956-P1-0005-CP1: Version 03 dated 08/06/2018; 9956-P1-0006-CP1: Version 03 dated 24/06/2019; 9956-P1-0007-CP1: Version 03 date 24/06/2019; 9956-P1-0008-CP1: Version 03 date 24/06/2019; 9956-P1-0009-CP1: Version 03 date 24/06/2019; 9956-P1-0010-CP1; Version 03 date 24/06/2019, 9956-P1-0011-CP1: Version 03 date 24/06/2019 9956-P1-0012-CP1: Version 03 date 24/06/2019, 9956-P1-0013-CP1 to 9956-P1-0023-CP1: Version 02 date 22/11/2019 and corresponding validation reports	<a href="http://cdm.unfccc.int/">http://cdm.unfccc.int/</a>	Others
B05	Web sites	Websites: <a href="http://cdm.unfccc.int/">http://cdm.unfccc.int/</a> <a href="http://www.ipcc-nggip.iges.or.jp/">http://www.ipcc-nggip.iges.or.jp/</a> <a href="http://www.pciaonline.org/testing">http://www.pciaonline.org/testing</a> <a href="http://circodu.org.ug/">http://circodu.org.ug/</a>	--	Others
B06	UNFCCC	Guidelines: Sampling and surveys for CDM project activities and programmes of activities, Version 04.0	<a href="http://cdm.unfccc.int/">http://cdm.unfccc.int/</a>	Others
B07	UNFCCC	Standard: Sampling and surveys for CDM project activities and programmes of activities, version 08.0	<a href="http://cdm.unfccc.int/">http://cdm.unfccc.int/</a>	Others
B08	UNFCCC	Guideline: Application of materiality in verifications" Version 02.0	<a href="http://cdm.unfccc.int/">http://cdm.unfccc.int/</a>	Others
B09	UNFCCC	Monitoring Reports and Verification Reports of the previous four monitoring periods for the PoA 9956	<a href="http://cdm.unfccc.int/">http://cdm.unfccc.int/</a>	Others

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

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

<b>FAR ID</b>	xx	<b>Section no.</b>		<b>Date:</b> DD/MM/YYYY
<b>Description of FAR</b>				
<b>CME response</b>				<b>Date:</b> DD/MM/YYYY
<b>Documentation provided by the CME</b>				
<b>DOE assessment</b>				<b>Date:</b> DD/MM/YYYY

Table 2. CLs from this verification

<b>CL ID</b>	01	<b>Section no.</b>	E.3.1	<b>Date:</b> 21/05/2020
<b>Description of CL</b>				
The design thermal efficiency of the stove models EZY, SHS and AES as stated in the MR in section C.1 and E.1 do not match with that document provided by the technology supplier. CME needs to clarify.				
<b>CME response</b>				<b>Date:</b> 22/05/2020
The design thermal efficiency of the stove models EZY, SHS and AES have been rectified in section C.1 and E.1 of the revised MR. The revised MR is being submitted.				
<b>Documentation provided by the CME</b>				
CDM PoA 9956 MP#6 MR1 ver 2.0 22052020				
<b>DOE assessment</b>				<b>Date:</b> 26/05/2020
The design efficiencies of the stove models EZY, SHS and AES have been corrected in the revised MR which has been cross checked with the manufacturer specification. The CL is closed.				

<b>CL ID</b>	02	<b>Section no.</b>	E.3.6.1	<b>Date:</b> 21/05/2020
<b>Description of CL</b>				
In the sub sheet "Sales database" of the ER spread sheet, in column H, it is stated "Start date of Stove crediting period (beginning of next month from sale)". But it is noted that CME has used the day after the stove distribution instead and not the beginning of next month. CME is requested to clarify.				
<b>CME response</b>				<b>Date:</b> 22/05/2020
This is attributed to typographical error. Cell H1 in the worksheet "Sales database" of the ER calculator has now been revised to state that crediting period for a given stove, starts from next day of its sale date.. The revised ER Calculator and MR are being submitted.				
<b>Documentation provided by the CME</b>				
CDM PoA 9956 Non Korean MP#6 ER Calculator ver 2.0 22052020				
<b>DOE assessment</b>				<b>Date:</b> 26/05/2020
CME is claiming the emission reductions from the next date of stove distribution and accordingly revised the typographical error in the ER spread sheet which is deemed acceptable. The CL is closed.				

<b>CL ID</b>	03	<b>Section no.</b>	E.3.6.5	<b>Date:</b> 21/05/2020
<b>Description of CL</b>				
For CPAs 13 to 23, for ex-ante estimation of ERs for the monitoring period, CME has considered 169 days. But considering the start date of crediting period for CPA 13 to 23, on 05/12/2019, the number of days for this MP is only 58. Also, it is noted that the annual energy savings as calculated in the ER spread sheet and reported in the MR is not for one year and it is for the monitoring period which is less than one year. CME is requested to clarify.				
<b>CME response</b>				<b>Date:</b> 22/05/2020

For CPAs 13 to 23, the ex-ante estimation of ERs for this monitoring period, have been revised based on the applicable number of days sheet. The ex-ante values of ERs for CPA 13 to 23 have also been updated in section F.4 & F.5 of the MR.	
Also, the revised ER calculator now specifies the annual thermal energy savings per CPA rather than thermal energy savings over the concerned monitoring period. The revised ER sheet and MR are being submitted.	
<b>Documentation provided by the CME</b>	
CDM PoA 9956 Non Korean MP#6 ER Calculator ver 2.0 22052020	
CDM PoA 9956 MP#6 MR1 ver 2.0 22052020	
<b>DOE assessment</b>	<b>Date:</b> 26/05/2020
CME has submitted revised MR and ER spread sheet with correct ex-ante calculations of ERs for the monitoring period and also the annual thermal energy savings for the monitoring period. The CL is closed.	

Table 3. CARs from this verification

<b>CAR ID</b>	01	<b>Section no.</b>	E.1.1	<b>Date:</b> 21/05/2020
<b>Description of CAR</b>				
As per the MR completing guidelines, all the numerical values should be in internationally recognized format. This has not been followed in various sections of the MR.				
<b>CME response</b>				<b>Date:</b> 22/05/2020
All the numerical values in the MR, have been revised to follow internationally recognized format. The revised MR is being submitted.				
<b>Documentation provided by the CME</b>				
CDM PoA 9956 MP#6 MR1 ver 2.0 22052020				
<b>DOE assessment</b>				<b>Date:</b> 26/05/2020
CME has submitted revised MR with appropriate number formats. The CAR is closed.				

Table 4. FARs from this verification

<b>FAR ID</b>	xx	<b>Section No.</b>		<b>Date:</b> DD/MM/YYYY
<b>Description of FAR</b>				
-				
<b>CME response</b>				<b>Date:</b> DD/MM/YYYY
-				
<b>Documentation provided by the CME</b>				
-				
<b>DOE assessment</b>				<b>Date:</b> DD/MM/YYYY
-				

## Appendix 5: Data and parameters fixed ex ante

Parameter	Quantity of woody biomass used in the absence of the project activity in tonnes per household ( $B_{old}$ )
Data unit:	Ton wood/HH-year
Default values used:	4.97
Purpose of data	Baseline emissions calculation
Source and Verification of the source	The value of this parameter is fixed ex-ante /B04/.

Parameter	Efficiency of the system being replaced ( $\eta_{old}$ )
Data unit:	Percentage
Default values used:	10% for CPA 01 to CPA 12 11.43% for CPA 13 to CPA 23
Purpose of data	Baseline emissions calculation
Source and Verification of the source	The value of this parameter is fixed ex-ante /B04/.

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

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

Parameter	Emission factor for the substitution of non-renewable woody biomass by similar consumers ( $EF_{projected\_fossil\_fuel}$ )
Data unit:	tCO <sub>2</sub> /TJ
Default values used:	81.60
Purpose of data	Baseline emissions calculation
Source and Verification of the source	The value of this parameter is fixed ex-ante /B04/.

Parameter	Fraction of woody biomass saved by the project activity in year y that can be established as non-renewable biomass. ( $f_{NRB,y}$ )
Data unit:	Percentage
Default values used:	82%
Purpose of data	Baseline emissions calculation
Source and Verification of the source	The value of this parameter is fixed ex-ante /B04/.

Parameter	Efficiency of the system being deployed at the time of CPA inclusion ( $\eta_{specified}$ )		
Data unit:	Percentage		
Default values used:		<b>Stove Type</b>	<b>Thermal Efficiency</b>
		EZY	27.10%
		SHS	26.00%
		AES	25.30%
		SHS-GBE	30.00%
		SHS-BOLD	37.30%
		SHS-ILF	38.00%
		Lugwana	34.75%
		SpendSmart	36.30%

**CDM-PoA-VCR-FORM**

		Energy Empire	33.00%	
		BM ESE	31.00%	
		FSL	35.70%	
Purpose of data	Baseline emissions calculation			
Source and Verification of the source	The value of this parameter is based on manufacturer specification /7/			

## Appendix 6: Data and parameters monitored

Monitoring Parameter Requirement	Assessment/ Observation by the DOE
Data / Parameter: (as in monitoring plan of CPA-DD):	Quantity of woody biomass used in the project activity by traditional stoves ( $\mu_{old}$ )
Measuring frequency/Time Interval:	Annual
Reporting frequency:	Annual
Reported value:	0.58 tonnes wood/year
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
Details of monitoring equipment:	Value obtained from monitoring survey of samples /5/
Is accuracy of the monitoring equipment as stated in the CPA-DD? If the CPA-DD does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practise?	NA
Calibration frequency /interval: Is it monitoring methodology /CDM EB guidance / local or national standards / manufacturers specification	NA
Is the calibration interval in line with the monitoring plan of the CPA-DD? If the CPA-DD does not specify the frequency of calibration, does the selected frequency represent good monitoring practise?	NA. QA/QC procedures stated in MR comply with CPA-DDs.
Company performing the calibration (internal or external calibration):	NA
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	NA
Is (are) calibration(s) valid for the whole reporting period?	NA
If applicable, has the reported data been cross-checked with other available data?	Yes, the reported data in MR has been compared with monitoring survey records /5/ and the ER sheet /4/.
How were the values in the monitoring report verified?	NA
Does the data management (from data generation to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the data management ensures correct transfer of data and reporting of emission reductions and all necessary QA/QC processes are in place.
In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	NA

Monitoring Parameter Requirement	Assessment/ Observation by the DOE		
Data / Parameter: (as in monitoring plan of CPA-DD):	Efficiency of the system being deployed as part of the project activity ( $\eta_{new}$ )		
Measuring frequency/Time Interval:	Annual		
Reporting frequency:	Annual		
Reported value:	<table border="1"> <tr> <td>Stove model</td><td>Average efficiency</td></tr> </table>	Stove model	Average efficiency
Stove model	Average efficiency		



	<table border="1"> <tr><td>AES</td><td>23.02%</td></tr> <tr><td>ENERGY EMPIRE</td><td>32.05%</td></tr> <tr><td>EZY</td><td>21.46%</td></tr> <tr><td>Lugwana</td><td>34.23%</td></tr> <tr><td>SHS</td><td>23.11%</td></tr> <tr><td>SHS-BOLD</td><td>36.12%</td></tr> <tr><td>SHS-GBE</td><td>28.96%</td></tr> <tr><td>SHS-ILF</td><td>36.74%</td></tr> <tr><td>FSL</td><td>34.94%</td></tr> <tr><td>BME</td><td>30.66%</td></tr> <tr><td>SpendSmart</td><td>35.57%</td></tr> </table> <p>Weighted average efficiency with and without considering the date of stove deployment was calculated and the lower of the two values was considered for ER calculation. The considered value of the efficiency is 31.16 %</p>	AES	23.02%	ENERGY EMPIRE	32.05%	EZY	21.46%	Lugwana	34.23%	SHS	23.11%	SHS-BOLD	36.12%	SHS-GBE	28.96%	SHS-ILF	36.74%	FSL	34.94%	BME	30.66%	SpendSmart	35.57%
AES	23.02%																						
ENERGY EMPIRE	32.05%																						
EZY	21.46%																						
Lugwana	34.23%																						
SHS	23.11%																						
SHS-BOLD	36.12%																						
SHS-GBE	28.96%																						
SHS-ILF	36.74%																						
FSL	34.94%																						
BME	30.66%																						
SpendSmart	35.57%																						
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes																						
Details of monitoring equipment:	<p>The stove efficiency testing has been determined by WBTs conducted in line with the guidance provided by the CME in the CPA-DDs /B04/ /15/. The monitoring equipment used for conducting the stove efficiencies by WBTs are thermometer, weighing scale, standard mass and moisture meter. All the monitoring equipment were calibrated as per national standard of host country (i.e. Uganda National Bureau of Standards) and hence deemed acceptable /13/.</p> <p>QA/QC procedures stated in MR comply with CPA-DDs.</p>																						
Is accuracy of the monitoring equipment as stated in the CPA-DD? If the CPA-DD does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practise?	CPA-DDs do not specify the accuracy of the monitoring equipment (thermometer, mass balance and moisture meter). Verification team confirms that the accuracy of the monitoring equipment used represent good monitoring practice based on sectoral expertise.																						
Calibration frequency /interval: Is it monitoring methodology /CDM EB guidance / local or national standards / manufacturers specification	NA																						
Is the calibration interval in line with the monitoring plan of the CPA-DD? If the CPA-DD does not specify the frequency of calibration, does the selected frequency represent good monitoring practise?	Please see the above comment																						
Company performing the calibration(internal or external calibration):	NA																						
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	NA																						
Is (are) calibration(s) valid for the whole reporting period?	NA																						
If applicable, has the reported data been cross-checked with other available data?	The data has been cross-checked with the WBT test documents /12/. For the stove efficiency parameter, WBT have been performed and this has been checked by the verification team with the related spreadsheets. Furthermore, the verification team has cross checked all the raw data input records in the WBT calculation spread sheets including the calculation procedure for the sampled households and found them to be correct. All the raw data forms																						

	<p>for the WBT carried out for efficiency parameter were checked by the verification team and thus no sampling of data is required.</p> <p>Correctness of the stove thermal efficiency values were verified by the verification team based on the review of the WBT calculation spread sheet for correctness of calculations in line with WBT protocol, original test records and review of measuring equipment used during WBTs for calibration and accuracy.</p>
How were the values in the monitoring report verified?	NA
Does the data management (from data generation to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	<p>Yes.</p> <p>As the monitoring parameter under consideration is determined by standardized test procedures (WBT), the QA/QC and calibrations are at the test conduction by the measuring team for WBT. Accordingly, the verification team has focused on abilities, qualifications and recognition of involved personnel and institutions of the measuring team involved in the WBT. The WBT has been carried by CIRCODU. The WBT has been carried out by the well-trained personnel and training certificate of the personnel has been provided to the verification team in this respect /10/. The training content /10/ has also been provided to the verification team. The verification team based on remote interviews and review of competency documents /18/ and training records /10/ confirms that the team was qualified to carry out the WBT in line with the protocol.</p>
In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	NA

Monitoring Parameter Requirement	Assessment/ Observation by the DOE		
Data / Parameter: (as in monitoring plan of CPA-DD):	Number of appliances deployed ( $N_y$ )		
Measuring frequency/Time Interval:	Continuous		
Reporting frequency:	Yearly		
Reported value:	CPA	Number of ICS Distributed	
	9956-P1-0001-CP1	11,279	
	9956-P1-0002-CP1	18,000	
	9956-P1-0003-CP1	18,000	
	9956-P1-0004-CP1	18,000	
	9956-P1-0005-CP1	18,000	
	9956-P1-0006-CP1	18,000	
	9956-P1-0007-CP1	18,000	
	9956-P1-0008-CP1	18,000	
	9956-P1-0009-CP1	18,000	
	9956-P1-0010-CP1	18,000	
	9956-P1-0011-CP1	18,000	
	9956-P1-0012-CP1	18,000	

	9956-P1-0013-CP1	15,000	
	9956-P1-0014-CP1	15,000	
	9956-P1-0015-CP1	15,000	
	9956-P1-0016-CP1	15,000	
	9956-P1-0017-CP1	15000	
	9956-P1-0018-CP1	15,000	
	9956-P1-0019-CP1	15,000	
	9956-P1-0020-CP1	15,000	
	9956-P1-0021-CP1	300	
	9956-P1-0022-CP1	300	
	9956-P1-0023-CP1	285	
	Total	330,164	
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes		
Details of monitoring equipment:	Sales database		
Is accuracy of the monitoring equipment as stated in the CPA-DD? If the CPA-DD does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practise?	An electronic sales database has been maintained for the project activity /6/.		
Calibration frequency /interval: Is it monitoring methodology /CDM EB guidance / local or national standards / manufacturers specification	NA		
Is the calibration interval in line with the monitoring plan of the CPA-DD? If the CPA-DD does not specify the frequency of calibration, does the selected frequency represent good monitoring practise?	NA. QA/QC procedures stated in MR comply with CPA-DDs.		
Company performing the calibration(internal or external calibration):	NA		
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	NA		
Is (are) calibration(s) valid for the whole reporting period?	NA		
If applicable, has the reported data been cross-checked with other available data?	Yes, the value of parameter has been cross-checked with the monitoring database and sample households and the scanned copy records were also checked.		
How were the values in the monitoring report verified?	NA		
Does the data management (from data generation to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the data management ensures correct transfer of data and reporting of emission reductions and all necessary QA/QC processes are in place.		
In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	NA		

Monitoring Parameter Requirement	Assessment/ Observation by the DOE
Data / Parameter: (as in monitoring plan of CPA-DD):	Average usage rate of appliance type being deployed (U <sub>y</sub> )

Measuring frequency/Time Interval:	Annual
Reporting frequency:	Annual
Reported value:	84.71 %
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
Details of monitoring equipment:	Value obtained from the monitoring survey of samples /5/
Is accuracy of the monitoring equipment as stated in the CPA-DD? If the CPA-DD does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practise?	NA
Calibration frequency /interval: Is it monitoring methodology /CDM EB guidance / local or national standards / manufacturers specification	NA.
Is the calibration interval in line with the monitoring plan of the CPA-DD? If the CPA-DD does not specify the frequency of calibration, does the selected frequency represent good monitoring practise?	NA. QA/QC procedures stated in MR comply with CPA-DD.
Company performing the calibration(internal or external calibration):	NA
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	NA
Is (are) calibration(s) valid for the whole reporting period?	NA
If applicable, has the reported data been cross-checked with other available data?	Yes, reported data in MR has been compared with monitoring survey records /5/ and the ER sheet /4/
How were the values in the monitoring report verified?	The values in the monitoring report were compared against the values in ER sheet
Does the data management (from data generation to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the data management ensures correct transfer of data and reporting of emission reductions and all necessary QA/QC processes are in place. The sampling surveys has been carried out by third party appointed well-trained personnel /10/. The training content /10/ has also been provided to the verification team. The verification team based on remote interviews and review of competency documents /18/ and training records /10/ confirms that the team was qualified to carry out the monitoring surveys.
In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	NA.

## Appendix 7: Assessment of Monitoring parameters monitored through sampling/surveys

SI. No.	Checklist Questions	Assessment												
1.	Does the Monitoring Report apply sampling for determination of ex-post monitoring parameters?	Yes, there are ex-post monitoring parameters determined through the sampling effort.												
2.	Is the applied sampling plan in accordance with the sampling plan proposed in the registered PoA-DD/ PDD?	Yes, the applied sampling plan is in accordance with the sampling plan proposed in the registered PoA-DD.												
3.	<p>List the parameters determined through sampling and respective parameters of interest.</p> <p>In situations where the monitoring of a parameter is based on data, which is being recorded only once at the time of implementation/distribution particularly for distribution projects, where there are large/dispersed number of project technology, the VV team shall assess the accuracy of such data/information during the onsite verification through document review and where applicable through acceptance sampling.</p> <p>The assessment of implementation status of distribution projects or projects having dispersed and large number of components, it is pertinent that the VV Team shall assess that all physical features (technology, project equipment, and monitoring and metering equipment) of the included CPAs/projects are as specified in the included CPA-DDs/PDD. In cases where the households/users are no longer using the project technology or have voluntarily left the project, it is important for VT to assess CME/PP's QA/QC procedures with regards to handling of its database and where applicable consider those dropped out from technology as a part of assessment of sampling requirements, including acceptance sampling by DOE.</p>	<p>Parameters determined through sampling and respective parameters of interest are:</p> <table border="1"> <thead> <tr> <th>Parameter</th><th>Description of Parameter</th><th>Parameter of Interest</th></tr> </thead> <tbody> <tr> <td><math>\eta_{new}</math></td><td>Thermal efficiency of the stoves</td><td>Mean</td></tr> <tr> <td><math>U_y</math></td><td>Average usage rate of the appliance</td><td>Proportion</td></tr> <tr> <td><math>\mu_{old}</math></td><td>Quantity of woody biomass used in the project activity by traditional stoves</td><td>Mean</td></tr> </tbody> </table>	Parameter	Description of Parameter	Parameter of Interest	$\eta_{new}$	Thermal efficiency of the stoves	Mean	$U_y$	Average usage rate of the appliance	Proportion	$\mu_{old}$	Quantity of woody biomass used in the project activity by traditional stoves	Mean
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4.	Is the sample size calculated in accordance with the formula presented in the registered PoA-DD/PDD?	Yes, the sample size calculated is in accordance with the formula presented in the approved revised PoA-DD/CPA-DDs.												
5.	<p>Are the assumptions used for calculation of sample size appropriate and correct?</p> <p>P.S.: Provide assessment on appropriateness of value of proportion (p), standard deviation (STDEV) or variance (v) used for calculation of sample size.</p>	<p>Stratified sampling was applied for cross CPA sampling for all the three parameters for annually monitoring with 95/10 confidence/precision by the CME for selection of the monitoring samples. The same is deemed acceptable as per the PoA-DD/CPA-DD.</p> <p>The proportion (p), standard deviation (STDEV) or variance (v) used for calculation of sample size are found to be appropriate. All assumptions for the calculation of sample size were used by the CME's experience which</p>												

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6.	<p>What are the sample sizes obtained for the parameters being monitored? Is the determined sample size deemed adequate for the parameter of interest being monitored?</p> <p>P.S.: If the sample size calculation returns a value of less than 30 samples, a minimum sample size of 30 shall be chosen when the parameter of interest is a proportion. If the parameter of interest is a numeric mean value (i.e. not a proportion or percentage) the Student's t-distribution shall be used if the resulting sample size is less than 30.</p> <p>While assessing the sampling effort by the PP/CME particularly the sample size, the VV Team shall make sure that the reliability criteria (confidence level and precision) should be as per the requirement of the applied methodology. Only when there is no specific guidance in the applied methodology for the sampling requirements, the confidence/precision as stated in the sampling standards should be considered. As a rule of thumb it is to be always kept in mind that the sampling requirements in the applied methodology shall take precedence.</p>	<p>has been checked by the verification team and deemed acceptable.</p> <p>It was found that for all the parameters, the respective confidence/precision was met. The number of samples for each of the parameters covered during the monitoring activity is as given below:</p> <table border="1" data-bbox="1205 311 2085 1340"> <thead> <tr> <th>Parameter</th><th>Sample Size (n)</th><th>Samples covered during monitoring</th></tr> </thead> <tbody> <tr><td><math>\eta_{new}</math> (AES)</td><td>2</td><td>2</td></tr> <tr><td><math>\eta_{new}</math> (EZY)</td><td>2</td><td>2</td></tr> <tr><td><math>\eta_{new}</math> (SHS)</td><td>2</td><td>3</td></tr> <tr><td><math>\eta_{new}</math> (SHS-GBE)</td><td>2</td><td>3</td></tr> <tr><td><math>\eta_{new}</math> (SHS-ILF)</td><td>2</td><td>2</td></tr> <tr><td><math>\eta_{new}</math> (SHS-BOLD)</td><td>3</td><td>3</td></tr> <tr><td><math>\eta_{new}</math> (Lugwana)</td><td>2</td><td>2</td></tr> <tr><td><math>\eta_{new}</math> (Energy Empire)</td><td>2</td><td>3</td></tr> <tr><td><math>\eta_{new}</math> (BME)</td><td>2</td><td>3</td></tr> <tr><td><math>\eta_{new}</math> (FSL)</td><td>2</td><td>2</td></tr> <tr><td><math>\eta_{new}</math> (SpendSmart)</td><td>2</td><td>3</td></tr> <tr><td><math>U_y</math> (AES)</td><td>2</td><td>4</td></tr> <tr><td><math>U_y</math> (EZY)</td><td>3</td><td>7</td></tr> <tr><td><math>U_y</math> (SHS)</td><td>6</td><td>12</td></tr> <tr><td><math>U_y</math> (SHS-GBE)</td><td>5</td><td>9</td></tr> <tr><td><math>U_y</math> (SHS-ILF)</td><td>7</td><td>18</td></tr> <tr><td><math>U_y</math> (SHS-BOLD)</td><td>13</td><td>18</td></tr> <tr><td><math>U_y</math> (Lugwana)</td><td>3</td><td>10</td></tr> <tr><td><math>U_y</math> (Energy Empire)</td><td>3</td><td>7</td></tr> <tr><td><math>U_y</math> (BME)</td><td>3</td><td>6</td></tr> <tr><td><math>U_y</math> (FSL)</td><td>2</td><td>5</td></tr> <tr><td><math>U_y</math> (SpendSmart)</td><td>3</td><td>4</td></tr> <tr><td><math>\mu_{old}</math> (2013)</td><td>2</td><td>2</td></tr> <tr><td><math>\mu_{old}</math> (2014)</td><td>2</td><td>2</td></tr> <tr><td><math>\mu_{old}</math> (2015)</td><td>2</td><td>2</td></tr> <tr><td><math>\mu_{old}</math> (2016)</td><td>2</td><td>2</td></tr> <tr><td><math>\mu_{old}</math> (2017)</td><td>2</td><td>2</td></tr> <tr><td><math>\mu_{old}</math> (2018)</td><td>2</td><td>4</td></tr> <tr><td><math>\mu_{old}</math> (2019)</td><td>4</td><td>7</td></tr> <tr><td><math>\mu_{old}</math> (2020)</td><td>2</td><td>2</td></tr> </tbody> </table> <p>For the mean parameters, Student's t-distribution has been used since the resulting sample size was less than 30.</p>	Parameter	Sample Size (n)	Samples covered during monitoring	$\eta_{new}$ (AES)	2	2	$\eta_{new}$ (EZY)	2	2	$\eta_{new}$ (SHS)	2	3	$\eta_{new}$ (SHS-GBE)	2	3	$\eta_{new}$ (SHS-ILF)	2	2	$\eta_{new}$ (SHS-BOLD)	3	3	$\eta_{new}$ (Lugwana)	2	2	$\eta_{new}$ (Energy Empire)	2	3	$\eta_{new}$ (BME)	2	3	$\eta_{new}$ (FSL)	2	2	$\eta_{new}$ (SpendSmart)	2	3	$U_y$ (AES)	2	4	$U_y$ (EZY)	3	7	$U_y$ (SHS)	6	12	$U_y$ (SHS-GBE)	5	9	$U_y$ (SHS-ILF)	7	18	$U_y$ (SHS-BOLD)	13	18	$U_y$ (Lugwana)	3	10	$U_y$ (Energy Empire)	3	7	$U_y$ (BME)	3	6	$U_y$ (FSL)	2	5	$U_y$ (SpendSmart)	3	4	$\mu_{old}$ (2013)	2	2	$\mu_{old}$ (2014)	2	2	$\mu_{old}$ (2015)	2	2	$\mu_{old}$ (2016)	2	2	$\mu_{old}$ (2017)	2	2	$\mu_{old}$ (2018)	2	4	$\mu_{old}$ (2019)	4	7	$\mu_{old}$ (2020)	2	2
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		<p>As the actual sample size in all the cases was not less than either the calculated sample size or the minimum sample size as per the PoA-DD/CPA-DDs, the sample size covered by the CME was accepted.</p> <p>The validation team further noted that the applied methodology AMS II.G, version 05 gives the option of 95/10 and 90/10 for biennial and annual monitoring. It does not specify for the case of across CPA sampling. Hence according to the sampling standard and the approved revised PoA-DD/CPA-DDs, CME has applied 95/10 confidence / precision for sampling purpose as across CPA sampling has been applied for the monitoring period. This is deemed acceptable to the validation team.</p>									
7.	<p>Has reliability specification been applied to determine the sampling requirements for each individual parameter value determined through a sampling effort?</p> <p>P.S.: If there is more than one parameter to be estimated in a CDM project activity, then a sample size calculation should be done for each of them. Then either the largest number for the sample size is chosen for the sampling effort with one common survey, or the sampling effort and survey is repeated for each of the parameters. A random sub-sample within the common survey is allowed as long as: (i) the reliability specification (e.g. 90/10 confidence/precision for small-scale CDM project activities and 95/10 for large scale CDM project activities) is achieved for each individual parameter; and (ii) the random sub-sample is consistent with the design of the survey and the corresponding sample size calculation.</p>	<p>Sampling for all the parameters was done across CPA with 95/10 confidence/precision. It was found that for all the parameters, the confidence/precision was met. The number of samples for each of the parameters covered during the monitoring activity is provided in the above row.</p> <p>For the mean parameters, t-distribution has been used since the resulting sample size was less than 30.</p>									
8.	Is the assumed response rate reasonable (appropriate and correct) for the determination of samples to be surveyed?	Yes, the assumed response rate is reasonable (appropriate and correct) for the determination of samples to be surveyed for each of the parameter of interest.									
9.	Is the sample selected by PP for determination of the monitored parameters unbiased (random) and representative?	Yes, the verification team, based on evidence for random number generator as provided by the CME, confirms that sample selected by the CME for determination of the monitored parameters are random. It can be considered as representative of the population.									
10.	Has minimum target level of precision been achieved based on estimates from the actual samples?	<p>Yes, the minimum target level of precision been achieved based on estimates from the actual samples.</p> <table border="1"> <thead> <tr> <th>Parameter</th><th>Target precision level</th><th>Precision achieved</th></tr> </thead> <tbody> <tr> <td><math>\eta_{new}</math></td><td>10%</td><td>0.22%</td></tr> <tr> <td><math>U_y</math></td><td>10%</td><td>0.21%</td></tr> </tbody> </table>	Parameter	Target precision level	Precision achieved	$\eta_{new}$	10%	0.22%	$U_y$	10%	0.21%
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		This has been checked and confirmed by reviewing Survey database and WBT results provided by the CME.			
11.	In case the minimum target level of precision has not been achieved based on estimates from the actual samples, please specify the approach adopted by PP to reach the required precision and also justify the appropriateness of the adopted approach in accordance with the applied methodology or paragraph 18 of Sampling and surveys for CDM project activities and programmes of activities (Version 08).	Not applicable since as assessed above the target level of precision has been achieved.			
12.	<p>Has VT applied acceptance sampling to verify that the results of sampling efforts undertaken by PP for determination of ex-post parameters. If yes, please provide a detailed justification of the approach adopted including information on (but not limited to):</p> <ul style="list-style-type: none"> <li>(a) Selected AQL Level</li> <li>(b) Selected UQL Level</li> <li>(c) Selected Consumer Risk Level</li> <li>(d) Selected Producer Risk Level</li> <li>(e) Sample Size chosen for acceptance sampling</li> <li>(f) Acceptance number (c)</li> </ul> <p>Approach adopted by VT to in case value of greater than c discrepant records were observed in the sample</p>	<p>In line with paragraph 26 of the Sampling Standard, the verification team has applied a sampling approach as part of verification. Now as the CME had applied sampling approach, the verification team has chosen acceptance sampling for the parameters in accordance with paragraph 28 of the sampling standard /B07/.</p> <p>DOE used sampling during verification for checking the operational status and to check if the WBT tests have been done in the households and it was confirmed that the WBT tests were conducted. Considering that Uganda is a Least Developed Country, applying paragraph 39 (c) of the sampling standard, version 08 /B07/, a sample size of 8 households was chosen (with no discrepant records). A sample size of 8 was required, based on an AQL of 1.0% and UQL of 20%, producer risk 10% and consumer risk 20%. Acceptance number (c) thus determined for the sample is 0. DOE interviewed 8 samples (each, for monitoring survey and WBTs conducted). It was observed that out of the 8 samples, all the 8 stoves were found to be operational and all the 8 households, where the WBTs were conducted, has confirmed that their stoves were taken by the CME for conducting water boiling tests and they received a new cookstoves as a replacement /12/ and this matched with the CME's records and hence no discrepant records were observed with the published MR /2/ and ER sheet /4/ and thus c=0. Thus, CME's set of records has been accepted in line with § 33 of the sampling standard, version 08 /B07/. Verification team has cross verified these sample documents during the remote interviews.</p>			
13.	Are the procedures for the selected survey and data collection method unambiguously defined and do they adequately provide for minimizing non-sampling errors?	Verification team based on remote interviews and review of documented procedure confirms that the selected survey and data collection method is unambiguously defined. This also adequately ensure minimizing non-sampling errors.			
14.	Have potential sources of bias inherent in the selected data collection method, such as self-selection and under-coverage, been anticipated? Have	Review of sampling records, documented procedure and remote interviews with the Personnel conducted WBT/Surveys does not any reveal sources			



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	mechanisms for mitigating these been considered?	of bias inherent in the selected data collection.
15.	Is the quality control and assurance strategy adequate?	Verification team based on review of provided supporting documents and remote interviews confirms that the quality control and assurance strategy is adequate.
16.	Are the proposed skill sets, qualifications and experience of the personnel/institutions engaged to conduct the standardized tests/data collection exercise adequate?	<p>For the monitoring <math>U_y</math> and <math>\mu_{old}</math> parameters, data were collected following a specially designed survey form. For thermal efficiency of the stoves WBT were conducted. As the monitoring parameter under consideration is determined by standardized test procedures, the QA/QC and calibrations are at the test conduction by the measuring team.</p> <p>Accordingly, the verification team has focused on abilities, qualifications and recognition of involved personnel and institutions of the measuring team involved in the WBT. The surveys and WBTs have been carried by CIRCODU. Competence / training evidence of the monitoring personnel have been provided to the verification team. During the remote interviews it was confirmed that the team was qualified as confirmed by reviewed training / competency documents and trained to carry out WBT in line with the protocol. The monitoring equipment used for conducting the stove efficiency tests are thermometer, weighing scale and moisture meter. These equipment are duly calibrated and hence deemed to be acceptable.</p>
17.	<p>Does the PP have a process in place to ensure data quality is maintained to a high standard? This should include:</p> <ol style="list-style-type: none"> <li>Are the personnel trained and experienced?</li> <li>What is the level of supervision and guidance provided to staff?</li> <li>Is there a standardized system for data entry and analysis to produce final result?</li> <li>Is there a system or process in place to minimize the introduction of errors?</li> <li>Is there a system in place to ensure all collected data is processed;</li> <li>Are quality checks performed on data entered, for example range checks,</li> <li>inconsistency checks, checking of subsamples of data by supervisors;</li> <li>is there a system to check for errors, record and report errors reported and document the remedial action taken;</li> <li>What is the level of security and type of backup processes to guarantee data integrity, for example methods to prevent fraud and accidental deletion?</li> </ol>	<p>Verification team based on review of provided supporting documents and remote interviews confirms the following:</p> <ul style="list-style-type: none"> <li>✓ the personnel involved in the WBT/surveys are trained and experienced.</li> <li>✓ there exists a standardized system for data entry and analysis to produce final result.</li> <li>✓ there exist a system or process in place to minimize the introduction of errors.</li> <li>✓ there a system in place to ensure all collected data is processed.</li> <li>✓ there exists a quality checks of data entered.</li> </ul>

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**Document information**

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

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