




**Verification and certification report form for
CDM programme of activities
(Version 04.0)**

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

BASIC INFORMATION

Title and UNFCCC reference number of the programme of activities (PoA)	Up Energy Improved Cookstove Programme, Uganda UNFCCC PoA reference number: 9956	
Version number(s) of the PoA-DD(s) to which this report applies	Version 4.0	
Version number of the verification and certification report	02	
Completion date of the verification and certification report	30/04/2021	
Monitoring period number and duration of this monitoring period	Eighth Monitoring Period 01/08/2020 - 31/12/2020 (including both the days)	
Number and version number of the monitoring report to which this report applies	Monitoring report number 2 Version 2.0 (Dated:29/04/2021)	
Coordinating/managing entity (CME)	UpEnergy Group	
Host Parties	Host Parties of the PoA	Is this a host Party to a CPA covered in this report? (yes/no)
	Uganda	Yes
Applied methodologies and standardized baselines	AMS-II.G., version 05, "Energy efficiency measures in thermal applications of non-renewable biomass"	
Mandatory sectoral scopes	3: Energy demand	
Conditional sectoral scopes, if applicable	Not applicable	
Estimated amount of GHG emission reductions or GHG removals for this monitoring period in the included CPAs covered in this report	9956-P1-0024-CP1 -- 17,217 tCO ₂ e 9956-P1-0025-CP1 -- 17,217 tCO ₂ e 9956-P1-0026-CP1 -- 17,217 tCO ₂ e 9956-P1-0027-CP1 -- 17,217 tCO ₂ e 9956-P1-0028-CP1 -- 17,217 tCO ₂ e 9956-P1-0029-CP1 -- 17,217 tCO ₂ e 9956-P1-0030-CP1 -- 17,217 tCO ₂ e 9956-P1-0031-CP1 -- 17,217 tCO ₂ e 9956-P1-0032-CP1 -- 17,217 tCO ₂ e 9956-P1-0033-CP1 -- 17,217 tCO ₂ e 9956-P1-0034-CP1 -- 17,217 tCO ₂ e 9956-P1-0035-CP1 -- 17,217 tCO ₂ e 9956-P1-0036-CP1 -- 17,217 tCO ₂ e 9956-P1-0037-CP1 -- 17,217 tCO ₂ e 9956-P1-0038-CP1 -- 17,217 tCO ₂ e 9956-P1-0039-CP1 -- 17,217 tCO ₂ e 9956-P1-0040-CP1 -- 17,217 tCO ₂ e 9956-P1-0041-CP1 -- 17,217 tCO ₂ e 9956-P1-0042-CP1 -- 17,217 tCO ₂ e 9956-P1-0043-CP1 -- 17,217 tCO ₂ e 9956-P1-0044-CP1 -- 17,217 tCO ₂ e	

	9956-P1-0045-CP1 -- 17,217 tCO ₂ e			
	Total -- 378,776 tCO₂e			
Certified amount of GHG emission reductions or GHG removals for this monitoring period for the included CPAs covered in this report	Amount before 1 January 2013	Amount from 1 January 2013 until 31 December 2020	Amount from 1 January 2021	
	--	9956-P1-0024-CP1 -- 10,619 tCO ₂ e	--	
		9956-P1-0025-CP1 -- 10,554 tCO ₂ e		
		9956-P1-0026-CP1 -- 10,486 tCO ₂ e		
		9956-P1-0027-CP1 -- 10,416 tCO ₂ e		
		9956-P1-0028-CP1 -- 10,348 tCO ₂ e		
		9956-P1-0029-CP1 -- 10,271 tCO ₂ e		
		9956-P1-0030-CP1 -- 10,194 tCO ₂ e		
		9956-P1-0031-CP1 -- 10,110 tCO ₂ e		
		9956-P1-0032-CP1 -- 10,031 tCO ₂ e		
		9956-P1-0033-CP1 -- 9,966 tCO ₂ e		
		9956-P1-0034-CP1 -- 9,818 tCO ₂ e		
		9956-P1-0035-CP1 -- 9,640 tCO ₂ e		
		9956-P1-0036-CP1 -- 9,482 tCO ₂ e		
		9956-P1-0037-CP1 -- 9,368 tCO ₂ e		
		9956-P1-0038-CP1 -- 9,253 tCO ₂ e		
		9956-P1-0039-CP1 -- 9,005 tCO ₂ e		
		9956-P1-0040-CP1 -- 8,728 tCO ₂ e		
		9956-P1-0041-CP1 -- 8,498 tCO ₂ e		
		9956-P1-0042-CP1 -- 8,211 tCO ₂ e		
		9956-P1-0043-CP1 -- 7,956 tCO ₂ e		
		9956-P1-0044-CP1 -- 7,640 tCO ₂ e		
		9956-P1-0045-CP1 -- 7,312 tCO ₂ e		
		Total -- 207,906 tCO₂e		
Name and UNFCCC reference number of the DOE	E-0052: Carbon Check (India) Private Ltd.			
Name, position and signature of the approver of the verification and certification report	Amit Anand, CEO 			

SECTION A. Executive summary

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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 0024 supported by Republic of Korea”; “Up Energy Improved Cookstove Programme, Uganda – CPA No 0025 supported by Republic of Korea”; “Up Energy Improved Cookstove Programme, Uganda – CPA No 0026 supported by Republic of Korea”; “Up Energy Improved Cookstove Programme, Uganda – CPA No 0027 supported by Republic of Korea”; “Up Energy Improved Cookstove Programme, Uganda – CPA No 0028 supported by Republic of Korea”; “Up Energy Improved Cookstove Programme, Uganda – CPA No 0029 supported by Republic of Korea”; “Up Energy Improved Cookstove Programme, Uganda – CPA No 0030 supported by Republic of Korea”; “Up Energy Improved Cookstove Programme, Uganda – CPA No 0031 supported by Republic of Korea”; “Up Energy Improved Cookstove Programme, Uganda – CPA No 0032 supported by Republic of Korea”; “Up Energy Improved Cookstove Programme, Uganda – CPA No 0033 supported by Republic of Korea”; “Up Energy Improved Cookstove Programme, Uganda – CPA No 0034 supported by Republic of Korea”; “Up Energy Improved Cookstove Programme, Uganda – CPA No 0035 supported by Republic of Korea”; “Up Energy Improved Cookstove Programme, Uganda – CPA No 0036 supported by Republic of Korea”; “Up Energy Improved Cookstove Programme, Uganda – CPA No 0037 supported by Republic of Korea”; “Up Energy Improved Cookstove Programme, Uganda – CPA No 0038 supported by Republic of Korea”; “Up Energy Improved Cookstove Programme, Uganda – CPA No 0039 supported by Republic of Korea”; “Up Energy Improved Cookstove Programme, Uganda – CPA No 0040 supported by Republic of Korea”; “Up Energy Improved Cookstove Programme, Uganda – CPA No 0041 supported by Republic of Korea”; “Up Energy Improved Cookstove Programme, Uganda – CPA No 0042 supported by Republic of Korea”; “Up Energy Improved Cookstove Programme, Uganda – CPA No 0043 supported by Republic of Korea”; “Up Energy Improved Cookstove Programme, Uganda – CPA No 0044 supported by Republic of Korea and “Up Energy Improved Cookstove Programme, Uganda – CPA No 0045 supported by Republic of Korea”.

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. As stated in the MR /02/ and verified during the remote interviews, Ecoeye Co., Ltd. and other Korean Entity(ies) have fully sponsored the distribution of the ICS in the CPAs (9956-P1-0024-CP1 to CPA 9956-P1-0045-CP1) in order to make them accessible to the beneficiaries, as well covered the cost of operation and management of the CPAs in a financially sustainable condition. The full sponsorship cost per ICS is USD 8.00 including the manufacturing cost of an ICS /16/.

The CPAs are designed to generate emission reductions by distribution of the fuel-efficient 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 01/08/2020 - 31/12/2020 (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
- To verify the implemented monitoring plan with the registered/included 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 01/08/2020 - 31/12/2020 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-P1-0024-CP1, 9956-P1-0025-CP1, 9956-P1-0026-CP1, 9956-P1-0027-CP1, 9956-P1-0028-CP1, 9956-P1-0029-CP1, 9956-P1-0030-CP1, 9956-P1-0031-CP1, 9956-P1-0032-CP1, 9956-P1-0033-CP1, 9956-P1-0034-CP1, 9956-P1-0035-CP1, 9956-P1-0036-CP1, 9956-P1-0037-CP1, 9956-P1-0038-CP1, 9956-P1-0039-CP1, 9956-P1-0040-CP1, 9956-P1-

0041-CP1, 9956-P1-0042-CP1, 9956-P1-0043-CP1, 9956-P1-0044-CP1 and 9956-P1-0045-CP1 as described in the CPA-DDs /B04/ and the Monitoring report, Version 2.0, dated 29/04/2021 /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 CPA DD/s. The monitoring system was implemented, 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 off site interviews, the verification team confirms that the PoA has resulted in the 207,906 tCO₂e emission reductions during the eighth monitoring period in the Monitoring Report number 2.

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	Agarwalla	Sanjay Kumar	CC IPL	X	-	X	X
2.	Local Expert	EI	Muganga	Rogers	CC IPL		-	X	
3.	Trainee Assessor	IR	Gedam	Pallavi Ganesh	CC IPL	X	-	X	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	Singh	Vikash Kumar	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	Medium	All the input data in the ER spreadsheet including sales database,	The risk was mitigated by the training of the personnel involved in the data capture,

	spreadsheet.		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/.	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 data changes/updates, version tracking, traceability, security	Medium	The data is recorded in the spreadsheets based on the raw data collected during the field visits. The access to the spreadsheets for calculation of ERs, monitoring and sales database and Stove efficiency testing records is controlled.	The identified risk was mitigated by managing access to the records. It was 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.
3.	Accuracy of the measuring equipment	Low	Check the calibration records for the measurement equipment used for efficiency test.	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).
4.	Competence of personnel involved in conducting standardized tests viz., WBT	Medium	Interview of the personnel involved and check the training records / accreditation certificates (applicable in case of institutions) involved in conducting such tests.	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.
5.	Sample	Medium	Sample size is suitable and the surveyed households at the CPA level are random.	Cross-check the procedure to identify the sample size against the sampling guideline and standard and confirm the sample size is calculated correctly.

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 5% of 207,906 tCO₂e which is equal to 10,395 tCO₂e.

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 10,395 tCO₂e is determined in line with § 308 (d) 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 assessing their competencies, skills, monitoring / testing procedure followed, understanding of the monitoring survey form / WBT protocol and testing procedure etc. and 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. This finding is detailed in Appendix 4 including its resolution. Therefore, related identified mistakes as listed in the finding in Appendix 4 have been determined to be immaterial. All identified inconsistencies and clarification request 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

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 at its 108th meeting, agreed to further extend the period in which DOEs may apply alternative measures of validation/verification to mandatory on-site inspections until 30 June 2021 because of COVID-19 /B05/ (https://cdm.unfccc.int/newsroom/latestnews/releases/2020/01041_index.html).

In view of the notification, DOE could not further postpone the site visit due to the fact that the DOE has a verification contract signed with CME specifying timeline for completion of the verification /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, CC IPL 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:

Duration of on-site inspection: 13/04/2021				
No.	Activity performed on-site	Site location	Date	Team member
1.	An assessment of the implementation and operation of the registered project activity as per the registered PoA-DD, CPA-DDs.	Remote interviews	13/04/2021	Sanjay Kumar Agarwalla Pallavi Gedam Rogers Muganga
2.	A review of information flows for generating, aggregating and reporting the monitoring parameters	Remote interviews	13/04/2021	Sanjay Kumar Agarwalla Pallavi Gedam 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	13/04/2021	Sanjay Kumar Agarwalla Pallavi Gedam 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	13/04/2021	Sanjay Kumar Agarwalla Pallavi Gedam 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	13/04/2021	Sanjay Kumar Agarwalla Pallavi Gedam
6.	A review of calculations and assumptions made in determining the GHG data and emission reductions	Remote interviews	13/04/2021	Sanjay Kumar Agarwalla Pallavi Gedam
7.	An identification of quality control and quality assurance procedures in place to	Remote interviews	13/04/2021	Sanjay Kumar Agarwalla

	prevent or identify and correct any errors or omissions in the reported monitoring parameters			Pallavi Gedam
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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.	13/04/2021	Project implementation and operation, monitoring procedure, data and information flow, Quality Assurance – Management and operating system, Monitoring records, MR and ER calculation	Sanjay Kumar Agarwalla, Rogers Muganga Pallavi Gedam
2.	Tiwari	Ashutosh	Climate-Secure India Pvt. Ltd.	13/04/2021	MR and ER calculation	Sanjay Kumar Agarwalla, Rogers Muganga, Pallavi Gedam
3.	Kartik	Anantha	UpEnergy Uganda	13/04/2021	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	Sanjay Kumar Agarwalla, Rogers Muganga Pallavi Gedam
4.	Wanyaka	Andrew	UpEnergy Uganda	13/04/2021	Project implementation and operation, Sales/Distribution records	Sanjay Kumar Agarwalla, Rogers Muganga, Pallavi Gedam
5.	Anayo	Sheila	UpEnergy Uganda	13/04/2021	Project implementation and operation, Sales/Distribution records	Sanjay Kumar Agarwalla, Rogers Muganga, Pallavi Gedam
6.	Arineitwe	Joseph Ndemere	CIRCODU	13/04/2021	WBT procedure and records	Sanjay Kumar Agarwalla, Pallavi Gedam
7.	Davis	Kintu	CIRCODU	13/04/2021	WBT procedure and records	Sanjay Kumar Agarwalla Pallavi Gedam
8.	Mubiriu	Julius	Monitoring surveyor	13/04/2021	Monitoring Survey	Sanjay Kumar Agarwalla,

					procedure and records	Pallavi Gedam
9.	Ha	Sangsun	EcoEye	13/04/2021	Project implementation and operation	Sanjay Kumar Agarwalla, Pallavi Gedam

D.4. Sampling approach

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As assessed in above sections, emission reductions for the twenty two CPAs, (9956-P1-0024-CP1, 9956-P1-0025-CP1, 9956-P1-0026-CP1, 9956-P1-0027-CP1, 9956-P1-0028-CP1, 9956-P1-0029-CP1, 9956-P1-0030-CP1, 9956-P1-0031-CP1, 9956-P1-0032-CP1, 9956-P1-0033-CP1, 9956-P1-0034-CP1, 9956-P1-0035-CP1, 9956-P1-0036-CP1, 9956-P1-0037-CP1, 9956-P1-0038-CP1, 9956-P1-0039-CP1, 9956-P1-0040-CP1, 9956-P1-0041-CP1, 9956-P1-0042-CP1, 9956-P1-0043-CP1, 9956-P1-0044-CP1 and 9956-P1-0045-CP1), are being claimed for this monitoring period and the total population of the stoves under these twenty two CPAs are as below:

S.No.	CPA Reference No.	Number of ICS Distributed
1	9956-P1-0024-CP1	9,369
2	9956-P1-0025-CP1	9,369
3	9956-P1-0026-CP1	9,369
4	9956-P1-0027-CP1	9,369
5	9956-P1-0028-CP1	9,369
6	9956-P1-0029-CP1	9,369
7	9956-P1-0030-CP1	9,369
8	9956-P1-0031-CP1	9,369
9	9956-P1-0032-CP1	9,369
10	9956-P1-0033-CP1	9,369
11	9956-P1-0034-CP1	9,369
12	9956-P1-0035-CP1	9,369
13	9956-P1-0036-CP1	9,369
14	9956-P1-0037-CP1	9,369
15	9956-P1-0038-CP1	9,369
16	9956-P1-0039-CP1	9,369
17	9956-P1-0040-CP1	9,369
18	9956-P1-0041-CP1	9,369
19	9956-P1-0042-CP1	9,369
20	9956-P1-0043-CP1	9,369
21	9956-P1-0044-CP1	9,369
22	9956-P1-0045-CP1	9,370
Total		206,119

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

1. The thermal efficiency of the ICS distributed (%) (η_{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 (μ_{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 (η_{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 (μ_{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 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 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"> • Consistency between the information as contained in Survey sheet and revealed from the remote interviews • Baseline scenario of the household • Enquire/observe the pre-project/baseline stove/s and its operation during the project scenario. • Enquire/observe parallel use of any other stove and their fuel 	DOE observation, accounting for duly justified differences.

		<ul style="list-style-type: none"> • Enquire/observe source /storage of fuelwood /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; checking the serial number of the stoves with the sampled user and cross-verifying with the replacement stove serial number mentioned in the monitoring records. Also, cross-verifying the serial number of the stoves tested by CIRCODU with that reported in the monitoring records.	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
General			
Compliance of the monitoring report with the monitoring report form	-	-	-
Remaining forward action requests from validation and/or previous verifications	-	-	-
CPAs considered for verification and covered in this report	-	-	-
Programme of activities	-	-	-
Compliance of the programme implementation with the registered PoA-DD	-	-	-
Implementation and operation of the management system	-	-	-
Post-registration changes	-	-	-
<ul style="list-style-type: none"> • Corrections 	-	-	-
<ul style="list-style-type: none"> • Inclusion of a monitoring plan 	-	-	-
<ul style="list-style-type: none"> • Permanent changes to the registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines, or other methodological regulatory documents¹ 	-	-	-
<ul style="list-style-type: none"> • Changes to the programme design 	-	-	-
<ul style="list-style-type: none"> • Addition of CPA inclusion template 	-	-	-
<ul style="list-style-type: none"> • Change of coordinating/managing entity 	-	-	-

¹ 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).

• Changes specific to afforestation and reforestation activities	-	-	-
Component project activities	-	-	-
Compliance of the CPA implementation with the included CPA design document	-	-	-
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	-	01	-
• 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	-	-	-
• 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	-	-	-
• Remarks on difference from estimated value in included CPA	-	-	-
Assessment of reported sustainable development co-benefits	-	-	-
Global stakeholder consultation	-	-	-
Others (please specify)	-	-	-
Total	-	01	-

SECTION E. Verification findings

E.1. General

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

Means of verification	DR, I
Findings	-
Conclusion	CME had used the Monitoring report form for CDM programme of activities, Version 03.0 /B03/ for the published MR which was later updated to latest available Version

	<p>04.0. 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 11/03/2021 of the monitoring report /1/, covering the monitoring period from 01/08/2020 to 31/12/2020 (both days inclusive) publicly available on 15/03/2021.</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 (seventh) verification of the PoA.

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

Title and UNFCCC reference number of the CPA included in the PoA as of the end of this monitoring period	Is the CPA considered for this verification? (yes/no)	The date when the CPA was included	Version of the PoA-DD	Confirmation that a request for issuance including the CPA has been published for the previous monitoring period (Y/N)
Up Energy Improved Cookstove Programme, Uganda – CPA No 001; 9956-P1-0001-CP1	No	22/07/2014	Version 4.0	Y
Up Energy Improved Cookstove Programme, Uganda – CPA No 002; 9956-P1-0002-CP1	No	17/03/2015		Y
Up Energy Improved Cookstove Programme, Uganda – CPA No 003; 9956-P1-0003-CP1	No	17/04/2015		Y
Up Energy Improved Cookstove Programme, Uganda – CPA No 004; 9956-P1-0004-CP1	No	17/04/2015		Y
Up Energy Improved Cookstove Programme, Uganda – CPA No 005; 9956-P1-0005-CP1	No	28/11/2016		Y
Up Energy Improved Cookstove Programme, Uganda – CPA No 006; 9956-P1-0006-CP1	No	28/11/2016		Y

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

Up Energy Improved Cookstove Programme, Uganda – CPA No 019; 9956-P1-0019-CP1	No	05/12/2019		Y
Up Energy Improved Cookstove Programme, Uganda – CPA No 020; 9956-P1-0020-CP1	No	05/12/2019		Y
Up Energy Improved Cookstove Programme, Uganda – CPA No 021; 9956-P1-0021-CP1	No	05/12/2019		Y
Up Energy Improved Cookstove Programme, Uganda – CPA No 022; 9956-P1-0022-CP1	No	05/12/2019		Y
Up Energy Improved Cookstove Programme, Uganda – CPA No 023; 9956-P1-0023-CP1	No	05/12/2019		Y
Up Energy Improved Cookstoves Programme, Uganda – CPA No 0024 supported by Republic of Korea - 9956-P1-0024-CP1	Yes	07/01/2020		Y
Up Energy Improved Cookstoves Programme, Uganda – CPA No 0025 supported by Republic of Korea - 9956-P1-0025-CP1	Yes	07/01/2020		Y
Up Energy Improved Cookstoves Programme, Uganda – CPA No 0026 supported by Republic of Korea - 9956-P1-0026-CP1	Yes	07/01/2020		Y
Up Energy Improved Cookstoves Programme, Uganda – CPA No 0027 supported by Republic of Korea - 9956-P1-0027-CP1	Yes	07/01/2020		Y
Up Energy Improved Cookstoves Programme, Uganda – CPA No 0028 supported by Republic of Korea - 9956-P1-0028-CP1	Yes	07/01/2020		Y

Up Energy Improved Cookstoves Programme, Uganda – CPA No 0029 supported by Republic of Korea - 9956-P1-0029-CP1	Yes	07/01/2020		Y
Up Energy Improved Cookstoves Programme, Uganda – CPA No 0030 supported by Republic of Korea - 9956-P1-0030-CP1	Yes	07/01/2020		Y
Up Energy Improved Cookstoves Programme, Uganda – CPA No 0031 supported by Republic of Korea - 9956-P1-0031-CP1	Yes	07/01/2020		Y
Up Energy Improved Cookstoves Programme, Uganda – CPA No 0032 supported by Republic of Korea - 9956-P1-0032-CP1	Yes	07/01/2020		Y
Up Energy Improved Cookstoves Programme, Uganda – CPA No 0033 supported by Republic of Korea - 9956-P1-0033-CP1	Yes	07/01/2020		Y
Up Energy Improved Cookstoves Programme, Uganda – CPA No 0034 supported by Republic of Korea - 9956-P1-0034-CP1	Yes	07/01/2020		Y
Up Energy Improved Cookstoves Programme, Uganda – CPA No 0035 supported by Republic of Korea - 9956-P1-0035-CP1	Yes	07/01/2020		Y
Up Energy Improved Cookstoves Programme, Uganda – CPA No 0036 supported by Republic of Korea - 9956-P1-0036-CP1	Yes	07/01/2020		Y

Up Energy Improved Cookstoves Programme, Uganda – CPA No 0037 supported by Republic of Korea - 9956-P1-0037-CP1	Yes	07/01/2020		Y
Up Energy Improved Cookstoves Programme, Uganda – CPA No 0038 supported by Republic of Korea - 9956-P1-0038-CP1	Yes	07/01/2020		Y
Up Energy Improved Cookstoves Programme, Uganda – CPA No 0039 supported by Republic of Korea - 9956-P1-0039-CP1	Yes	07/01/2020		Y
Up Energy Improved Cookstoves Programme, Uganda – CPA No 0040 supported by Republic of Korea - 9956-P1-0040-CP1	Yes	07/01/2020		Y
Up Energy Improved Cookstoves Programme, Uganda – CPA No 0041 supported by Republic of Korea - 9956-P1-0041-CP1	Yes	07/01/2020		Y
Up Energy Improved Cookstoves Programme, Uganda – CPA No 0042 supported by Republic of Korea - 9956-P1-0042-CP1	Yes	07/01/2020		Y
Up Energy Improved Cookstoves Programme, Uganda – CPA No 0043 supported by Republic of Korea - 9956-P1-0043-CP1	Yes	07/01/2020		Y
Up Energy Improved Cookstoves Programme, Uganda – CPA No 0044 supported by Republic of Korea - 9956-P1-0044-CP1	Yes	07/01/2020		Y

Up Energy Improved Cookstoves Programme, Uganda – CPA No 0045 supported by Republic of Korea - 9956-P1-0045-CP1	Yes	07/01/2020		Y
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E.2. Programme of activities

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

Means of verification	Document Review, Interview
Findings	--
Conclusion	<p>CCIPL 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 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

Means of verification	Document Review, Interview
Findings	--
Conclusion	<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 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

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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

>>

Not applicable

E.3. Component project activities

E.3.1. Compliance of the CPA implementation with the included CPA design document

Means of verification	Document Review, Interview	
Findings	--	
Conclusion	The implementation status of the PoA and the component project activities is:	
	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 024 supported by Republic of Korea
CPA reference number:	9956-P1-0024-CP1
Date of inclusion:	07/01/2020
CPA implementer	Ecoeye Co., Ltd.
Project Scale:	Small scale
Location of the CPA:	Uganda
CPA crediting period:	07/01/2020 to 06/01/2027
Reported monitoring Period verified in this verification:	01/08/2020 - 31/12/2020

Title of the CPA:	Up Energy Improved Cookstove Programme, Uganda – CPA No 025 supported by Republic of Korea
CPA reference number:	9956-P1-0025-CP1
Date of inclusion:	07/01/2020
CPA implementer	Ecoeye Co., Ltd.
Project Scale:	Small scale
Location of the CPA:	Uganda
CPA crediting period:	07/01/2020 to 06/01/2027
Reported monitoring Period verified in this verification:	01/08/2020 - 31/12/2020

Title of the CPA:	Up Energy Improved Cookstove Programme, Uganda – CPA No 026 supported by Republic of Korea
CPA reference number:	9956-P1-0026-CP1
Date of inclusion:	07/01/2020
CPA implementer	Ecoeye Co., Ltd.
Project Scale:	Small scale
Location of the CPA:	Uganda
CPA crediting period:	07/01/2020 to 06/01/2027
Reported monitoring Period verified in this verification:	01/08/2020 - 31/12/2020

Title of the CPA:	Up Energy Improved Cookstove Programme, Uganda – CPA No 027 supported by Republic of Korea
CPA reference number:	9956-P1-0027-CP1
Date of inclusion:	07/01/2020
CPA implementer	Ecoeye Co., Ltd.
Project Scale:	Small scale
Location of the CPA:	Uganda
CPA crediting period:	07/01/2020 to 06/01/2027
Reported monitoring Period verified in this verification:	01/08/2020 - 31/12/2020

Title of the CPA:	Up Energy Improved Cookstove Programme, Uganda – CPA No 0028 supported by Republic of Korea
CPA reference number:	9956-P1-0028-CP1
Date of inclusion:	07/01/2020
CPA implementer	Ecoeye Co., Ltd.
Project Scale:	Small scale

Location of the CPA:	Uganda
CPA crediting period:	07/01/2020 to 06/01/2027
Reported monitoring Period verified in this verification:	01/08/2020 - 31/12/2020

Title of the CPA:	Up Energy Improved Cookstove Programme, Uganda – CPA No 029 supported by Republic of Korea
CPA reference number:	9956-P1-00029-CP1
Date of inclusion:	07/01/2020
CPA implementer	Ecoeye Co., Ltd.
Project Scale:	Small scale
Location of the CPA:	Uganda
CPA crediting period:	07/01/2020 to 06/01/2027
Reported monitoring Period verified in this verification:	01/08/2020 - 31/12/2020

Title of the CPA:	Up Energy Improved Cookstove Programme, Uganda – CPA No 030 supported by Republic of Korea
CPA reference number:	9956-P1-0030-CP1
Date of inclusion:	07/01/2020
CPA implementer	Ecoeye Co., Ltd.
Project Scale:	Small scale
Location of the CPA:	Uganda
CPA crediting period:	07/01/2020 to 06/01/2027
Reported monitoring Period verified in this verification:	01/08/2020 - 31/12/2020

Title of the CPA:	Up Energy Improved Cookstove Programme, Uganda – CPA No 031 supported by Republic of Korea
CPA reference number:	9956-P1-0031-CP1
Date of inclusion:	07/01/2020
CPA implementer	Ecoeye Co., Ltd.
Project Scale:	Small scale
Location of the CPA:	Uganda
CPA crediting period:	07/01/2020 to 06/01/2027
Reported monitoring Period verified in this verification:	01/08/2020 - 31/12/2020

Title of the CPA:	Up Energy Improved Cookstove Programme, Uganda – CPA No 032 supported by Republic of Korea
CPA reference number:	9956-P1-0032-CP1
Date of inclusion:	07/01/2020
CPA implementer	Ecoeye Co., Ltd.
Project Scale:	Small scale
Location of the CPA:	Uganda
CPA crediting period:	07/01/2020 to 06/01/2027
Reported monitoring Period verified in this verification:	01/08/2020 - 31/12/2020

Title of the CPA:	Up Energy Improved Cookstove Programme, Uganda – CPA No 033 supported by Republic of Korea
CPA reference number:	9956-P1-0033-CP1
Date of inclusion:	07/01/2020
CPA implementer	Ecoeye Co., Ltd.
Project Scale:	Small scale
Location of the CPA:	Uganda

CPA crediting period:	07/01/2020 to 06/01/2027
Reported monitoring Period verified in this verification:	01/08/2020 - 31/12/2020

Title of the CPA:	Up Energy Improved Cookstove Programme, Uganda – CPA No 034 supported by Republic of Korea
CPA reference number:	9956-P1-0034-CP1
Date of inclusion:	07/01/2020
CPA implementer	Ecoeye Co., Ltd.
Project Scale:	Small scale
Location of the CPA:	Uganda
CPA crediting period:	07/01/2020 to 06/01/2027
Reported monitoring Period verified in this verification:	01/08/2020 - 31/12/2020

Title of the CPA:	Up Energy Improved Cookstove Programme, Uganda – CPA No 035 supported by Republic of Korea
CPA reference number:	9956-P1-0035-CP1
Date of inclusion:	07/01/2020
CPA implementer	Ecoeye Co., Ltd.
Project Scale:	Small scale
Location of the CPA:	Uganda
CPA crediting period:	07/01/2020 to 06/01/2027
Reported monitoring Period verified in this verification:	01/08/2020 - 31/12/2020

Title of the CPA:	Up Energy Improved Cookstove Programme, Uganda – CPA No 036 supported by Republic of Korea
CPA reference number:	9956-P1-0036-CP1
Date of inclusion:	07/01/2020
CPA implementer	Ecoeye Co., Ltd.
Project Scale:	Small scale
Location of the CPA:	Uganda
CPA crediting period:	07/01/2020 to 06/01/2027
Reported monitoring Period verified in this verification:	01/08/2020 - 31/12/2020

Title of the CPA:	Up Energy Improved Cookstove Programme, Uganda – CPA No 037 supported by Republic of Korea
CPA reference number:	9956-P1-0037-CP1
Date of inclusion:	07/01/2020
CPA implementer	Ecoeye Co., Ltd.
Project Scale:	Small scale
Location of the CPA:	Uganda
CPA crediting period:	07/01/2020 to 06/01/2027
Reported monitoring Period verified in this verification:	01/08/2020 - 31/12/2020

Title of the CPA:	Up Energy Improved Cookstove Programme, Uganda – CPA No 0038 supported by Republic of Korea
CPA reference number:	9956-P1-0038-CP1
Date of inclusion:	07/01/2020
CPA implementer	Ecoeye Co., Ltd.
Project Scale:	Small scale
Location of the CPA:	Uganda

CPA crediting period:	07/01/2020 to 06/01/2027
Reported monitoring Period verified in this verification:	01/08/2020 - 31/12/2020

Title of the CPA:	Up Energy Improved Cookstove Programme, Uganda – CPA No 039 supported by Republic of Korea
CPA reference number:	9956-P1-0039-CP1
Date of inclusion:	07/01/2020
CPA implementer	Ecoeye Co., Ltd.
Project Scale:	Small scale
Location of the CPA:	Uganda
CPA crediting period:	07/01/2020 to 06/01/2027
Reported monitoring Period verified in this verification:	01/08/2020 - 31/12/2020

Title of the CPA:	Up Energy Improved Cookstove Programme, Uganda – CPA No 040 supported by Republic of Korea
CPA reference number:	9956-P1-0040-CP1
Date of inclusion:	07/01/2020
CPA implementer	Ecoeye Co., Ltd.
Project Scale:	Small scale
Location of the CPA:	Uganda
CPA crediting period:	07/01/2020 to 06/01/2027
Reported monitoring Period verified in this verification:	01/08/2020 - 31/12/2020

Title of the CPA:	Up Energy Improved Cookstove Programme, Uganda – CPA No 041 supported by Republic of Korea
CPA reference number:	9956-P1-0041-CP1
Date of inclusion:	07/01/2020
CPA implementer	Ecoeye Co., Ltd.
Project Scale:	Small scale
Location of the CPA:	Uganda
CPA crediting period:	07/01/2020 to 06/01/2027
Reported monitoring Period verified in this verification:	01/08/2020 - 31/12/2020

Title of the CPA:	Up Energy Improved Cookstove Programme, Uganda – CPA No 042 supported by Republic of Korea
CPA reference number:	9956-P1-0042-CP1
Date of inclusion:	07/01/2020
CPA implementer	Ecoeye Co., Ltd.
Project Scale:	Small scale
Location of the CPA:	Uganda
CPA crediting period:	07/01/2020 to 06/01/2027
Reported monitoring Period verified in this verification:	01/08/2020 - 31/12/2020

Title of the CPA:	Up Energy Improved Cookstove Programme, Uganda – CPA No 043 supported by Republic of Korea
CPA reference number:	9956-P1-0043-CP1
Date of inclusion:	07/01/2020
CPA implementer	Ecoeye Co., Ltd.
Project Scale:	Small scale
Location of the CPA:	Uganda
CPA crediting period:	07/01/2020 to 06/01/2027

Reported monitoring Period verified in this verification:	01/08/2020 - 31/12/2020
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Title of the CPA:	Up Energy Improved Cookstove Programme, Uganda – CPA No 044 supported by Republic of Korea
CPA reference number:	9956-P1-0044-CP1
Date of inclusion:	07/01/2020
CPA implementer	Ecoeye Co., Ltd.
Project Scale:	Small scale
Location of the CPA:	Uganda
CPA crediting period:	07/01/2020 to 06/01/2027
Reported monitoring Period verified in this verification:	01/08/2020 - 31/12/2020

Title of the CPA:	Up Energy Improved Cookstove Programme, Uganda – CPA No 045 supported by Republic of Korea
CPA reference number:	9956-P1-0045-CP1
Date of inclusion:	07/01/2020
CPA implementer	Ecoeye Co., Ltd.
Project Scale:	Small scale
Location of the CPA:	Uganda
CPA crediting period:	07/01/2020 to 06/01/2027
Reported monitoring Period verified in this verification:	01/08/2020 - 31/12/2020

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 Ecoeye Co., Ltd. The portable improved cook stoves (ICS) under the CPAs use charcoal /7/ as fuel. These ICSs are efficient in transferring heat from the fuel to the pot, thus saving charcoal/wood 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-P1-0024-CP1	9,369
2	9956-P1-0025-CP1	9,369
3	9956-P1-0026-CP1	9,369
4	9956-P1-0027-CP1	9,369
5	9956-P1-0028-CP1	9,369
6	9956-P1-0029-CP1	9,369
7	9956-P1-0030-CP1	9,369
8	9956-P1-0031-CP1	9,369
9	9956-P1-0032-CP1	9,369
10	9956-P1-0033-CP1	9,369
11	9956-P1-0034-CP1	9,369
12	9956-P1-0035-CP1	9,369
13	9956-P1-0036-CP1	9,369
14	9956-P1-0037-CP1	9,369
15	9956-P1-0038-CP1	9,369
16	9956-P1-0039-CP1	9,369
17	9956-P1-0040-CP1	9,369

18	9956-P1-0041-CP1	9,369
19	9956-P1-0042-CP1	9,369
20	9956-P1-0043-CP1	9,369
21	9956-P1-0044-CP1	9,369
22	9956-P1-0045-CP1	9,370
Total		206,119

The annual energy savings in GWh_{th} for the CPAs for the monitoring period were as follows:

CPA	GWh _{th}	Comment
9956-P1-0024-CP1	105.43	In all the cases, energy savings is less than the threshold of 180 GWh _{th} for small scale project
9956-P1-0025-CP1	104.79	
9956-P1-0026-CP1	104.11	
9956-P1-0027-CP1	103.41	
9956-P1-0028-CP1	102.74	
9956-P1-0029-CP1	101.98	
9956-P1-0030-CP1	101.21	
9956-P1-0031-CP1	100.38	
9956-P1-0032-CP1	99.60	
9956-P1-0033-CP1	98.95	
9956-P1-0034-CP1	97.47	
9956-P1-0035-CP1	95.72	
9956-P1-0036-CP1	94.15	
9956-P1-0037-CP1	93.01	
9956-P1-0038-CP1	91.87	
9956-P1-0039-CP1	89.41	
9956-P1-0040-CP1	86.66	
9956-P1-0041-CP1	84.37	
9956-P1-0042-CP1	81.52	
9956-P1-0043-CP1	79.00	
9956-P1-0044-CP1	75.85	
9956-P1-0045-CP1	72.60	

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 CPA-DDs /B04/. Ecoeye Co., Ltd. is 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 CPA-DDs /B04/.

The Monitoring report /2/ is the Monitoring Report number 2 for the eighth monitoring period (01/08/2020 to 31/12/2020) for CPA 024 to CPA 045.

CC IPL's verification team considers the project description of the project contained in the registered PoA-DD and the 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 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 CC IPL, there is no change to the project design. CC IPL'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 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 _y)	CPA 24 to CPA 45 - 15,200 each	CPA 24 to CPA 44 - 9,369 each, CPA 45-9,370	The number of cook-stoves distributed under each of the CPAs is far below that stated in the CPA-DDs.																											
Efficiency of the ICS (η _{new})	34.51%	Weighted average values of 34.90 % for all the CPAs together	<div>The verification team noted that the individual thermal efficiencies as per the stove manufacturer and stated in the CPA-DDs and that monitored during the current monitoring period as given in the below table:</div> <table><tr><th>Stove Type</th><th>Efficiency stated in the CPA DD</th><th>Monitoring efficiency</th></tr><tr><td>BME</td><td>31.00%</td><td>30.51%</td></tr><tr><td>Energy Empire</td><td>33.00%</td><td>32.53 %</td></tr><tr><td>Lugwana</td><td>34.75%</td><td>34.14%</td></tr><tr><td>RH</td><td>36.30%</td><td>35.80%</td></tr><tr><td>SHS-BOLD</td><td>37.30%</td><td>36.54%</td></tr><tr><td>SHS-ILF</td><td>38.00%</td><td>37.06%</td></tr><tr><td>SpendSmart</td><td>36.35%</td><td>35.73%</td></tr><tr><td>TG</td><td>35.90%</td><td>35.27%</td></tr></table> <div>The monitored thermal efficiency for all the models of stoves is less than the estimated values in the CPA-DDs which is deemed acceptable to the verification team.</div>	Stove Type	Efficiency stated in the CPA DD	Monitoring efficiency	BME	31.00%	30.51%	Energy Empire	33.00%	32.53 %	Lugwana	34.75%	34.14%	RH	36.30%	35.80%	SHS-BOLD	37.30%	36.54%	SHS-ILF	38.00%	37.06%	SpendSmart	36.35%	35.73%	TG	35.90%	35.27%
Stove Type	Efficiency stated in the CPA DD	Monitoring efficiency																												
BME	31.00%	30.51%																												
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SHS-ILF	38.00%	37.06%																												
SpendSmart	36.35%	35.73%																												
TG	35.90%	35.27%																												
Quantity of woody biomass used in the project activity by traditional stoves (μ _{old})	0.497	0.42 tonnes/year	The amount of woody biomass consumption that is consumed 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 less than the ex-ante estimated 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.																											
Average usage rate of appliance (U _y)	95%	93.65 %	The average usage rate of the stove is based on the actual monitored ex-post value for the current monitoring period. 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)			<p>The ERs per stove per annum are slightly more than the ex-ante estimated values in the CPA-DDs. The verification team noted the following reasons for this increase:</p> <ul style="list-style-type: none"> - In the CPA-DDs simple average of the stove efficiencies for different model was taken whereas the value used in the ER calculation for the current monitoring period is weighted average of the different models based on actual monitored values in line with the methodology. It is further noted that individual thermal efficiencies of the different stove model are less than the ex ante values stated in the CPA-DDs. - Furthermore, there is decrease in value for μ_{old} which is deemed acceptable to the verification team as it is based on actual monitored data.
	2.71	CPA 24 to CPA 45: 2.73		
<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 CPA-DDs.</p> <p>The verification team took cognizance of § 340, § 341 and § 342 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 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)

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

>>

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 to any of the CPAs.

PRC for CPA 1 to CPA 4 was approved on 06/09/2018

(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

>>

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

Means of verification	Document Review, Interview
Findings	-
Conclusion	<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 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

Means of verification	Document Review, Interview
Findings	-
Conclusion	<p>Verification team confirms that the Data and parameters fixed ex ante are in compliance with the CPA-DDs /B04/ and the monitoring plan. Please refer Appendix 4 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

Means of verification	Document Review, Interview
Findings	CAR 01 had been raised and resolved. Please refer to Appendix 4 for further details.
Conclusion	The Verification team confirms that the Data and parameters monitored are in

	<p>compliance with the 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>
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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-two CPAs considered for the monitoring period is 206,119. The monitoring parameters required to be monitored through the sampling plan are:</p> <ol style="list-style-type: none">1. The thermal efficiency of the ICS distributed (%) (η_{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 (μ_{old}) <p>Cross-CPA stratified sampling was applied for the twenty two 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. For the thermal efficiency of the stoves (η_{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 (μ_{old}) 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 upto 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 required</th><th>Size (n)</th><th>Samples covered during monitoring</th></tr><tr><td>η_{new} (BME)</td><td>2</td><td></td><td>2</td></tr><tr><td>η_{new}(ENERGY EMPIRE)</td><td>2</td><td></td><td>2</td></tr><tr><td>η_{new} (Lugwana)</td><td>2</td><td></td><td>2</td></tr><tr><td>η_{new} (RH)</td><td>2</td><td></td><td>2</td></tr><tr><td>η_{new} (SHS-BOLD)</td><td>3</td><td></td><td>3</td></tr><tr><td>η_{new} (SHS-ILF)</td><td>2</td><td></td><td>2</td></tr><tr><td>η_{new} (SpendSmart)</td><td>2</td><td></td><td>2</td></tr><tr><td>η_{new} (TG)</td><td>2</td><td></td><td>2</td></tr><tr><td>U_y (BME)</td><td>7</td><td></td><td>8</td></tr><tr><td>U_y (ENERGY EMPIRE)</td><td>2</td><td></td><td>5</td></tr><tr><td>U_y (Lugwana)</td><td>2</td><td></td><td>5</td></tr><tr><td>U_y (RH)</td><td>2</td><td></td><td>5</td></tr><tr><td>U_y (SHS-BOLD)</td><td>10</td><td></td><td>15</td></tr><tr><td>U_y (SHS-ILF)</td><td>8</td><td></td><td>10</td></tr><tr><td>U_y (SpendSmart)</td><td>2</td><td></td><td>4</td></tr><tr><td>U_y (TG)</td><td>2</td><td></td><td>5</td></tr><tr><td>μ_{old} (2020)</td><td>7</td><td></td><td>15</td></tr></table> <p>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/.</p>	Parameter	Sample required	Size (n)	Samples covered during monitoring	η_{new} (BME)	2		2	η_{new} (ENERGY EMPIRE)	2		2	η_{new} (Lugwana)	2		2	η_{new} (RH)	2		2	η_{new} (SHS-BOLD)	3		3	η_{new} (SHS-ILF)	2		2	η_{new} (SpendSmart)	2		2	η_{new} (TG)	2		2	U_y (BME)	7		8	U_y (ENERGY EMPIRE)	2		5	U_y (Lugwana)	2		5	U_y (RH)	2		5	U_y (SHS-BOLD)	10		15	U_y (SHS-ILF)	8		10	U_y (SpendSmart)	2		4	U_y (TG)	2		5	μ_{old} (2020)	7		15
Parameter	Sample required	Size (n)	Samples covered during monitoring																																																																						
η_{new} (BME)	2		2																																																																						
η_{new} (ENERGY EMPIRE)	2		2																																																																						
η_{new} (Lugwana)	2		2																																																																						
η_{new} (RH)	2		2																																																																						
η_{new} (SHS-BOLD)	3		3																																																																						
η_{new} (SHS-ILF)	2		2																																																																						
η_{new} (SpendSmart)	2		2																																																																						
η_{new} (TG)	2		2																																																																						
U_y (BME)	7		8																																																																						
U_y (ENERGY EMPIRE)	2		5																																																																						
U_y (Lugwana)	2		5																																																																						
U_y (RH)	2		5																																																																						
U_y (SHS-BOLD)	10		15																																																																						
U_y (SHS-ILF)	8		10																																																																						
U_y (SpendSmart)	2		4																																																																						
U_y (TG)	2		5																																																																						
μ_{old} (2020)	7		15																																																																						

	<p>For the monitoring parameters U_y and μ_{old}, data were collected following a specially designed survey form. For thermal efficiency of the stoves WBTs (Water Boiling Tests) were conducted.</p> <p>The verification team has checked and found that for all the parameters the confidence/precision of 95/10 was met.</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.</p> <p>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 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

Means of verification	Document Review, Interview
Findings	-
Conclusion	<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 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

Means of verification	Document Review, Interview												
Findings	-												
Conclusion	<p>The equations for baseline emissions, as provided in the Monitoring report /2/ and confirmed with the 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>ER_y = Emission reductions during the year y in tCO₂e</p> <p>$B_{y,savings}$ = Quantity of biomass that is saved in tonnes per appliance</p> <p>$f_{NRB,y}$ = Fraction of biomass saved by the project activity in year y that can be established as non-renewable biomass using survey results, national or local statistics or other sources of information (fixed ex ante as 82%)</p> <p>$NCV_{biomass}$ = Net calorific value of the non-renewable biomass that is substituted (IPCC default for wood fuel, 0.015 TJ/tonne)</p> <p>$EF_{projected_fossilfuel}$ = Emission factor for the substitution of non-renewable biomass by similar consumer (Default value of 81.6 tCO₂/TJ).</p> <p>N_y = Number of appliances of the type being deployed during the period y</p> <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</p> <p>By savings = $[(B_{old} - \mu_{old}) \times L] \times (1 - \eta_{old} / \eta_{new})$</p> <p>$B_{old}$ = Quantity of biomass used in the absence of the project activity in tonnes/year (4.97 as per the CPA-DDs)</p> <p>η_{old} = Efficiency of the system being replaced (fixed ex ante)</p> <p>η_{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)</p> <p>L = Net to gross Adjustment factor (0.95) applied in accordance with AMS-II.G, ver 05</p> <p>μ_{old} = Quantity of woody biomass for the continued use of old stoves</p> <p>From the above equation and the parameter values, emission reductions are calculated as:</p> <table border="1"> <thead> <tr> <th>Specific-case CPA reference number</th><th>Emission Reductions (tCO₂e)</th></tr> </thead> <tbody> <tr> <td>9956-P1-0024-CP1</td><td>10,619</td></tr> <tr> <td>9956-P1-0025-CP1</td><td>10,554</td></tr> <tr> <td>9956-P1-0026-CP1</td><td>10,486</td></tr> <tr> <td>9956-P1-0027-CP1</td><td>10,416</td></tr> <tr> <td>9956-P1-0028-CP1</td><td>10,348</td></tr> </tbody> </table>	Specific-case CPA reference number	Emission Reductions (tCO ₂ e)	9956-P1-0024-CP1	10,619	9956-P1-0025-CP1	10,554	9956-P1-0026-CP1	10,486	9956-P1-0027-CP1	10,416	9956-P1-0028-CP1	10,348
Specific-case CPA reference number	Emission Reductions (tCO ₂ e)												
9956-P1-0024-CP1	10,619												
9956-P1-0025-CP1	10,554												
9956-P1-0026-CP1	10,486												
9956-P1-0027-CP1	10,416												
9956-P1-0028-CP1	10,348												

	9956-P1-0029-CP1	10,271
	9956-P1-0030-CP1	10,194
	9956-P1-0031-CP1	10,110
	9956-P1-0032-CP1	10,031
	9956-P1-0033-CP1	9,966
	9956-P1-0034-CP1	9,818
	9956-P1-0035-CP1	9,640
	9956-P1-0036-CP1	9,482
	9956-P1-0037-CP1	9,368
	9956-P1-0038-CP1	9,253
	9956-P1-0039-CP1	9,005
	9956-P1-0040-CP1	8,728
	9956-P1-0041-CP1	8,498
	9956-P1-0042-CP1	8,211
	9956-P1-0043-CP1	7,956
	9956-P1-0044-CP1	7,640
	9956-P1-0045-CP1	7,312
	Total	207,906
	The verification team confirms that the calculation of baseline emission and emission reductions is in accordance with the applied methodological equation and the 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

Means of verification	Document Review, Interview
Findings	-
Conclusion	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

Means of verification	Document Review, Interview
Findings	-
Conclusion	<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 CPA-DDs /B04/.</p>

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

Means of verification	Document Review, Interview
Findings	-
Conclusion	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 CPA-DDs. The total number of ERs achieved during the monitoring period is 207,906 tCO ₂ e.

	<p>In summary, verification team confirms that actual emission reduction is lower than the estimate of the 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>
--	---

Title and UNFCCC reference number of the CPA	Baseline emissions or baseline net GHG removals by sinks (tCO ₂ e)	Project emissions or actual net GHG removals by sinks (tCO ₂ e)	Leakage (tCO ₂ e)	GHG emission reductions or net GHG removals by sinks (tCO ₂ e)		
				Amount achieved before 1 January 2013	Amount achieved from 1 January 2013	Amount achieved in the entire monitoring period
9956-P1-0024-CP1	10,619	-	-	0	10,619	10,619
9956-P1-0025-CP1	10,554	-	-	0	10,554	10,554
9956-P1-0026-CP1	10,486	-	-	0	10,486	10,486
9956-P1-0027-CP1	10,416	-	-	0	10,416	10,416
9956-P1-0028-CP1	10,348	-	-	0	10,348	10,348
9956-P1-0029-CP1	10,271	-	-	0	10,271	10,271
9956-P1-0030-CP1	10,194	-	-	0	10,194	10,194
9956-P1-0031-CP1	10,110	-	-	0	10,110	10,110
9956-P1-0032-CP1	10,031	-	-	0	10,031	10,031
9956-P1-0033-CP1	9,966	-	-	0	9,966	9,966
9956-P1-0034-CP1	9,818	-	-	0	9,818	9,818
9956-P1-0035-CP1	9,640	-	-	0	9,640	9,640
9956-P1-0036-CP1	9,482	-	-	0	9,482	9,482
9956-P1-0037-CP1	9,368	-	-	0	9,368	9,368
9956-P1-0038-CP1	9,253	-	-	0	9,253	9,253
9956-P1-0039-CP1	9,005	-	-	0	9,005	9,005
9956-P1-0040-CP1	8,728	-	-	0	8,728	8,728
9956-P1-0041-CP1	8,498	-	-	0	8,498	8,498
9956-P1-0042-CP1	8,211	-	-	0	8,211	8,211
9956-P1-0043-CP1	7,956	-	-	0	7,956	7,956
9956-P1-0044-CP1	7,640	-	-	0	7,640	7,640
9956-P1-0045-CP1	7,312	-	-	0	7,312	7,312
Total	207,906				207,906	207,906

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

Means of verification	Document Review
Findings	
Conclusion	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/.

Title and UNFCCC reference number of the CPA	Actual values achieved by the CPAs during this monitoring period	Value estimated in ex ante calculation in the included CPA-DD(s)
9956-P1-0024-CP1	10,619	17,217
9956-P1-0025-CP1	10,554	17,217
9956-P1-0026-CP1	10,486	17,217
9956-P1-0027-CP1	10,416	17,217
9956-P1-0028-CP1	10,348	17,217
9956-P1-0029-CP1	10,271	17,217
9956-P1-0030-CP1	10,194	17,217
9956-P1-0031-CP1	10,110	17,217
9956-P1-0032-CP1	10,031	17,217
9956-P1-0033-CP1	9,966	17,217
9956-P1-0034-CP1	9,818	17,217
9956-P1-0035-CP1	9,640	17,217
9956-P1-0036-CP1	9,482	17,217
9956-P1-0037-CP1	9,368	17,217
9956-P1-0038-CP1	9,253	17,217
9956-P1-0039-CP1	9,005	17,217
9956-P1-0040-CP1	8,728	17,217
9956-P1-0041-CP1	8,498	17,217
9956-P1-0042-CP1	8,211	17,217
9956-P1-0043-CP1	7,956	17,217
9956-P1-0044-CP1	7,640	17,217
9956-P1-0045-CP1	7,312	17,217
Total	207,906	378,776

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

Means of verification	Document review
Findings	-
Conclusion	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

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

E.3.8. Global stakeholder consultation

Means of verification	Not applicable (as this is not first Monitoring report)
Findings	-
Conclusion	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

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

SECTION G. Verification opinion

>>

Carbon Check (India) Private Ltd. has performed the eighth periodic verification in the Monitoring Report number 2 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 0024 supported by Republic of Korea”; “Up Energy Improved Cookstove Programme, Uganda – CPA No 0025 supported by Republic of Korea”; “Up Energy Improved Cookstove Programme, Uganda – CPA No 0026 supported by Republic of Korea”; “Up Energy Improved Cookstove Programme, Uganda – CPA No 0027 supported by Republic of Korea”; “Up Energy Improved Cookstove Programme, Uganda – CPA No 0028 supported by Republic of Korea”; “Up Energy Improved Cookstove Programme, Uganda – CPA No 0029 supported by Republic of Korea”; “Up Energy Improved Cookstove Programme, Uganda – CPA No 0030 supported by Republic of Korea”; “Up Energy Improved Cookstove Programme, Uganda – CPA No 0031 supported by Republic of Korea”; “Up Energy Improved Cookstove Programme, Uganda – CPA No 0032 supported by Republic of Korea”; “Up Energy Improved Cookstove Programme, Uganda – CPA No 0033 supported by Republic of Korea”; “Up Energy Improved Cookstove Programme, Uganda – CPA No 0034 supported by Republic of Korea”; “Up Energy Improved Cookstove Programme, Uganda – CPA No 0035 supported by Republic of Korea”; “Up Energy Improved Cookstove Programme, Uganda – CPA No 0036 supported by Republic of Korea”; “Up Energy Improved Cookstove Programme, Uganda – CPA No 0037 supported by Republic of Korea”; “Up Energy Improved Cookstove Programme, Uganda – CPA No 0038 supported by Republic of Korea”; “Up Energy Improved Cookstove Programme, Uganda – CPA No 0039 supported by Republic of Korea”; “Up Energy Improved Cookstove Programme, Uganda – CPA No 0040 supported by Republic of Korea”; “Up Energy Improved Cookstove Programme, Uganda – CPA No 0041 supported by Republic of Korea”; “Up Energy Improved Cookstove Programme, Uganda – CPA No 0042 supported by Republic of Korea”; “Up Energy Improved Cookstove Programme, Uganda – CPA No 0043 supported by Republic of Korea”; “Up Energy Improved Cookstove Programme, Uganda – CPA No 0044 supported by Republic of Korea” and “Up Energy Improved Cookstove Programme, Uganda – CPA No 0045 supported by Republic of Korea”.

The verification team assigned by the DOE concludes that the PoA-DD (Version 4.0, dated 30/06/2014), CPAs 9956-P1-0024-CP1, 9956-P1-0025-CP1, 9956-P1-0026-CP1, 9956-P1-0027-CP1, 9956-P1-0028-CP1, 9956-P1-0029-CP1, 9956-P1-0030-CP1, 9956-P1-0031-CP1, 9956-P1-0032-CP1, 9956-P1-0033-CP1, 9956-P1-0034-CP1, 9956-P1-0035-CP1, 9956-P1-0036-CP1, 9956-P1-0037-CP1, 9956-P1-0038-CP1, 9956-P1-0039-CP1, 9956-P1-0040-CP1, 9956-P1-0041-CP1, 9956-P1-0042-CP1, 9956-P1-0043-CP1, 9956-P1-0044-CP1 and 9956-P1-0045-CP1 as described in the CPA-DDs /B04/ and the Monitoring report (Version 2.0, dated 29/04/2021) /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 22/02/2021 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 CPA DDs for 9956-P1-0024-CP1, 9956-P1-0025-CP1, 9956-P1-0026-CP1, 9956-P1-0027-

- CP1, 9956-P1-0028-CP1, 9956-P1-0029-CP1, 9956-P1-0030-CP1, 9956-P1-0031-CP1, 9956-P1-0032-CP1, 9956-P1-0033-CP1, 9956-P1-0034-CP1, 9956-P1-0035-CP1, 9956-P1-0036-CP1, 9956-P1-0037-CP1, 9956-P1-0038-CP1, 9956-P1-0039-CP1, 9956-P1-0040-CP1, 9956-P1-0041-CP1, 9956-P1-0042-CP1, 9956-P1-0043-CP1, 9956-P1-0044-CP1 and 9956-P1-0045-CP1 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, 11/03/2021) on 15/03/2021
 - 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 (13/04/2021)
 - Resolution of CARs and CLs raised during verification
 - Issuance of Verification Report

The component project activities were correctly implemented according to the selected monitoring methodology, monitoring plan and the 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 207,906 tCO₂e emission reductions during the eighth monitoring period for the second batch of CPAs (CPA 24 to CPA 45).

Verified emission reductions:

Specific-case CPA reference number	Emission Reduction (tCO ₂ e)
9956-P1-0024-CP1	10,619
9956-P1-0025-CP1	10,554
9956-P1-0026-CP1	10,486
9956-P1-0027-CP1	10,416
9956-P1-0028-CP1	10,348
9956-P1-0029-CP1	10,271
9956-P1-0030-CP1	10,194
9956-P1-0031-CP1	10,110
9956-P1-0032-CP1	10,031
9956-P1-0033-CP1	9,966
9956-P1-0034-CP1	9,818
9956-P1-0035-CP1	9,640
9956-P1-0036-CP1	9,482
9956-P1-0037-CP1	9,368
9956-P1-0038-CP1	9,253
9956-P1-0039-CP1	9,005
9956-P1-0040-CP1	8,728
9956-P1-0041-CP1	8,498
9956-P1-0042-CP1	8,211
9956-P1-0043-CP1	7,956
9956-P1-0044-CP1	7,640
9956-P1-0045-CP1	7,312

Total	207,906
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The break-up of emission reduction upto 31st December 2012 and 1st 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 until 31 December 2020	Emission reductions from 1 January 2021
Emission reductions (t CO ₂ e)	0	207,906	0

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-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 01/08/2020 - 31/12/2020.
- 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 11/03/2021 and 29/04/2021 respectively.

This statement covers verification period from 01/08/2020 - 31/12/2020 (both dates included)

The DOE had raised 01 corrective action request which has 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 CPA-DDs are fairly stated.

The DOE, hereby certifies that the project activity, achieved emission reductions by sources of GHG equal to 207,906 tCO₂e 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 until 31 December 2020	Emission reductions from 1 January 2021
Emission reductions (t CO ₂ e)	0	207,906	0

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 ₂	Carbon Dioxide
CO ₂ 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.

Sanjay Agarwalla

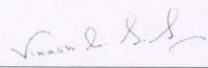
has been qualified as per CCIPL's internal qualification procedures, in accordance with requirements of Accreditation Standard (version 07.0):

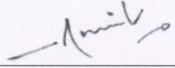
For following functions:

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 Assessor ¹	<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 checked="" type="checkbox"/>	TA 9.2	<input checked="" type="checkbox"/>	TA 13.2	<input 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 checked="" type="checkbox"/>	TA 5.1	<input checked="" type="checkbox"/>	TA 9.1	<input checked="" type="checkbox"/>	TA 13.1	<input checked="" type="checkbox"/>		


Mr. Vikash Kumar Singh
Compliance Officer


Mr. Amit Anand
CEO

Date of Approval
24/12/2020

Valid Till
24/12/2021

Revision History of the Document

26/12/2014	Initial Adoption
24/12/2015	Annual Revision
20/01/2016	Interim Revision for office address change
23/12/2017	Annual Revision
24/12/2017	Annual Revision
24/12/2018	Annual Revision
24/12/2019	Annual Revision
01/03/2020	Interim Revision for office address change
01/09/2020	Interim Revision for CCIPL logo change
24/12/2020	Annual Revision

¹ India

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

In the following Technical Areas:

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

Mr. Amit Anand
CEO

Date of Approval
24/12/2020

Valid Till
24/12/2021

Revision History of the Document

26/12/2014	Initial Adoption
24/12/2015	Annual Revision
20/01/2016	Interim Revision for office address change
23/12/2017	Annual Revision
24/12/2017	Annual Revision
24/12/2018	Annual Revision
24/12/2019	Annual Revision
01/03/2020	Interim Revision for office address change
01/09/2020	Interim Revision for CCIPL logo change
24/12/2020	Annual Revision

¹ India, South Africa

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Appendix 3. Documents reviewed or referenced

No.	Author	Title	References to the document	Provider
1	UpEnergy	- Webhosted Monitoring report	Version 1.0, dated 11/03/2021	CME
2	UpEnergy	Final Monitoring report	Version 2.0, dated 29/04/2021	CME
3	UpEnergy	Emission reduction calculation spread sheets for the twenty two CPAs corresponding to /1/	Version 1.0, dated 17/03/2021	CME
4	UpEnergy	Emission reduction calculation spread sheets for the twenty two CPAs corresponding to /2/	Version 1.0, dated 17/03/2021	CME
5	UpEnergy	Survey records for the monitoring period (for U_y and μ_{old})	-	CME
6	UpEnergy	CPA distribution records including evidence for the dates of distribution	-	CME
7	UpEnergy	Stove specifications for BME, Energy Empire, Lugwana, RH, SHS-BOLD, SHS-ILF, SpendSmart and TG 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"> • Conducting of the monitoring survey using the questionnaire • Checking of the quantity of fuel usage in each of the sampled households for the use of traditional stove • Handling and use of measuring instruments • Conducting water boiling tests using WBT Protocol version 4.2.3 • Data recording 		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	-	CME

		monitoring equipment (thermometer, weighing scale, Moisture meter)		
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 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 manufacturers	-	CME
20	UpEnergy	Verification contract signed in between DOE and CME	22/02/2021	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	http://cdm.unfccc.int/	Others
B02	UNFCCC	Applied baseline and monitoring methodology, AMS-II.G, version 05.0	http://cdm.unfccc.int/	Others
B03	UNFCCC	Instructions for filling out the monitoring report form for CDM programme of activities, version 03.0 and version 04.0	http://cdm.unfccc.int/	Others
B04	UNFCCC	Registered PoA-DD, Version 4.0 dated 30/06/2014; CPA-DD for 9956-P1-0024-CP1 to 9956-P1-0045-CP1: Version 2.1 date 09/12/2019 and corresponding validation reports	http://cdm.unfccc.int/	Others
B05	Web sites	Websites: http://cdm.unfccc.int/ http://www.ipcc-nggip.iges.or.jp/ http://www.pciaonline.org/testing http://circodu.org.ug/	==	Others
B06	UNFCCC	Guidelines: Sampling and surveys for CDM project activities and programmes of activities, Version 04.0	http://cdm.unfccc.int/	Others
B07	UNFCCC	Standard: Sampling and surveys for CDM project activities and programmes of activities, version 08.0	http://cdm.unfccc.int/	Others
B08	UNFCCC	Guideline: Application of materiality in verifications" Version 02.0	http://cdm.unfccc.int/	Others
B09	UNFCCC	Monitoring Reports and Verification Reports of the previous four monitoring periods for the PoA 9956	http://cdm.unfccc.int/	Others

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

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

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

Table 2. CLs from this verification

CL ID	xx	Section no.		Date: DD/MM/YYYY
Description of CL				
-				
CME response				Date: DD/MM/YYYY
-				
Documentation provided by the CME				
-				
DOE assessment				Date: DD/MM/YYYY
-				

Table 3. CARs from this verification

CAR ID	01	Section no.	E.3.4.2	Date: 20/04/2021
Description of CAR				
The emission reduction value in the published MR and the submitted ER spread sheet are inconsistent including the values of the monitored parameters " μ_{old} ", " U_y " and the number of surveyed samples. CME needs to confirm on the correct values.				
CME response				Date: 29/04/2021
The values specified in the ER sheet are correct. The difference in values in the MR were due to oversight and have been corrected now. The revised documents are being submitted.				
Documentation provided by the CME				
Revised MR				
DOE assessment				Date: 30/04/2021
In the published MR, CME had stated incorrect values. Correct input values have been cross-checked by the verification team from the ER spread sheet and supporting documents like survey forms, WBT records. The revised MR is found to be consistent with the ER spread sheet. The CAR is closed.				

Table 4. FARs from this verification

FAR ID	xx	Section No.		Date: DD/MM/YYYY
Description of FAR				
-				
CME response				Date: DD/MM/YYYY
-				
Documentation provided by the CME				
-				
DOE assessment				Date: 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 (η_{old})
Data unit:	Percentage
Default values used:	11.43%
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 ₂ /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:	<table border="1"> <thead> <tr> <th>Stove Type</th><th>Thermal Efficiency</th></tr> </thead> <tbody> <tr> <td>BME</td><td>31.00%</td></tr> <tr> <td>Energy Empire</td><td>33.00%</td></tr> <tr> <td>Lugwana</td><td>34.75%</td></tr> <tr> <td>RH</td><td>36.30%</td></tr> <tr> <td>SHS-BOLD</td><td>37.30%</td></tr> <tr> <td>SHS-ILF</td><td>38.00%</td></tr> <tr> <td>SpendSmart</td><td>36.35%</td></tr> </tbody> </table>	Stove Type	Thermal Efficiency	BME	31.00%	Energy Empire	33.00%	Lugwana	34.75%	RH	36.30%	SHS-BOLD	37.30%	SHS-ILF	38.00%	SpendSmart	36.35%
Stove Type	Thermal Efficiency																
BME	31.00%																
Energy Empire	33.00%																
Lugwana	34.75%																
RH	36.30%																
SHS-BOLD	37.30%																
SHS-ILF	38.00%																
SpendSmart	36.35%																

	TG	35.90%	
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 (μ_{old})
Measuring frequency/Time Interval:	Annual
Reporting frequency:	Annual
Reported value:	0.42 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 /02/.
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	Assessment/ Observation by the DOE
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Requirement																			
Data / Parameter: (as in monitoring plan of CPA-DD):	Efficiency of the system being deployed as part of the project activity (η_{new})																		
Measuring frequency/Time Interval:	Annual																		
Reporting frequency:	Annual																		
Reported value:	<table border="1"> <thead> <tr> <th>Stove Model</th><th>Average Efficiency</th></tr> </thead> <tbody> <tr> <td>BME</td><td>30.51%</td></tr> <tr> <td>ENERGY EMPIRE</td><td>32.53 %</td></tr> <tr> <td>Lugwana</td><td>34.14%</td></tr> <tr> <td>RH</td><td>35.80%</td></tr> <tr> <td>SHS-BOLD</td><td>36.54%</td></tr> <tr> <td>SHS-ILF</td><td>37.06%</td></tr> <tr> <td>SpendSmart</td><td>35.73%</td></tr> <tr> <td>TG</td><td>35.27%</td></tr> </tbody> </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 34.90 %</p>	Stove Model	Average Efficiency	BME	30.51%	ENERGY EMPIRE	32.53 %	Lugwana	34.14%	RH	35.80%	SHS-BOLD	36.54%	SHS-ILF	37.06%	SpendSmart	35.73%	TG	35.27%
Stove Model	Average Efficiency																		
BME	30.51%																		
ENERGY EMPIRE	32.53 %																		
Lugwana	34.14%																		
RH	35.80%																		
SHS-BOLD	36.54%																		
SHS-ILF	37.06%																		
SpendSmart	35.73%																		
TG	35.27%																		
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes																		
Details of monitoring equipment:	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/. QA/QC procedures stated in MR comply with CPA-DDs.																		
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	NA																		

proper functioning of monitoring equipment? (Yes / No):	
Is (are) calibration(s) valid for the whole reporting period?	NA
If applicable, has the reported data been cross-checked with other available data?	<p>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 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-P1-0024-CP1	9,369	
	9956-P1-0025-CP1	9,369	
	9956-P1-0026-CP1	9,369	
	9956-P1-0027-CP1	9,369	

	9956-P1-0028-CP1	9,369	
	9956-P1-0029-CP1	9,369	
	9956-P1-0030-CP1	9,369	
	9956-P1-0031-CP1	9,369	
	9956-P1-0032-CP1	9,369	
	9956-P1-0033-CP1	9,369	
	9956-P1-0034-CP1	9,369	
	9956-P1-0035-CP1	9,369	
	9956-P1-0036-CP1	9,369	
	9956-P1-0037-CP1	9,369	
	9956-P1-0038-CP1	9,369	
	9956-P1-0039-CP1	9,369	
	9956-P1-0040-CP1	9,369	
	9956-P1-0041-CP1	9,369	
	9956-P1-0042-CP1	9,369	
	9956-P1-0043-CP1	9,369	
	9956-P1-0044-CP1	9,369	
	9956-P1-0045-CP1	9,370	
Total	206,119		
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	NA		

theoretically possible been applied or has a request for deviation been approved?	
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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 _y)
Measuring frequency/Time Interval:	Annual
Reporting frequency:	Annual
Reported value:	93.65 %
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>η_{new}</td><td>Thermal efficiency of the stoves</td><td>Mean</td></tr> <tr> <td>U_y</td><td>Average usage rate of the appliance</td><td>Proportion</td></tr> <tr> <td>μ_{old}</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	η_{new}	Thermal efficiency of the stoves	Mean	U_y	Average usage rate of the appliance	Proportion	μ_{old}	Quantity of woody biomass used in the project activity by traditional stoves	Mean
Parameter	Description of Parameter	Parameter of Interest												
η_{new}	Thermal efficiency of the stoves	Mean												
U_y	Average usage rate of the appliance	Proportion												
μ_{old}	Quantity of woody biomass used in the project activity by traditional stoves	Mean												
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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		has been checked by the verification team and deemed acceptable.																																																						
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>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"> <thead> <tr> <th>Parameter</th><th>Sample Size (n)</th><th>Samples covered during monitoring</th></tr> </thead> <tbody> <tr> <td>η_{new} (BME)</td><td>2</td><td>2</td></tr> <tr> <td>η_{new}(ENERGY EMPIRE)</td><td>2</td><td>2</td></tr> <tr> <td>η_{new} (Lugwana)</td><td>2</td><td>2</td></tr> <tr> <td>η_{new} (RH)</td><td>2</td><td>2</td></tr> <tr> <td>η_{new} (SHS-BOLD)</td><td>3</td><td>3</td></tr> <tr> <td>η_{new} (SHS-ILF)</td><td>2</td><td>2</td></tr> <tr> <td>η_{new} (SpendSmart)</td><td>2</td><td>2</td></tr> <tr> <td>η_{new} (TG)</td><td>2</td><td>2</td></tr> <tr> <td>U_y (BME)</td><td>7</td><td>8</td></tr> <tr> <td>U_y (ENERGY EMPIRE)</td><td>2</td><td>5</td></tr> <tr> <td>U_y (Lugwana)</td><td>2</td><td>5</td></tr> <tr> <td>U_y (RH)</td><td>2</td><td>5</td></tr> <tr> <td>U_y (SHS-BOLD)</td><td>10</td><td>15</td></tr> <tr> <td>U_y (SHS-ILF)</td><td>8</td><td>10</td></tr> <tr> <td>U_y (SpendSmart)</td><td>2</td><td>4</td></tr> <tr> <td>U_y (TG)</td><td>2</td><td>5</td></tr> <tr> <td>μ_{old} (2020)</td><td>7</td><td>15</td></tr> </tbody> </table> <p>For the mean parameters, t-distribution has been used since the resulting sample size was less than 30.</p> <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-</p>	Parameter	Sample Size (n)	Samples covered during monitoring	η_{new} (BME)	2	2	η_{new} (ENERGY EMPIRE)	2	2	η_{new} (Lugwana)	2	2	η_{new} (RH)	2	2	η_{new} (SHS-BOLD)	3	3	η_{new} (SHS-ILF)	2	2	η_{new} (SpendSmart)	2	2	η_{new} (TG)	2	2	U_y (BME)	7	8	U_y (ENERGY EMPIRE)	2	5	U_y (Lugwana)	2	5	U_y (RH)	2	5	U_y (SHS-BOLD)	10	15	U_y (SHS-ILF)	8	10	U_y (SpendSmart)	2	4	U_y (TG)	2	5	μ_{old} (2020)	7	15
Parameter	Sample Size (n)	Samples covered during monitoring																																																						
η_{new} (BME)	2	2																																																						
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U_y (SHS-ILF)	8	10																																																						
U_y (SpendSmart)	2	4																																																						
U_y (TG)	2	5																																																						
μ_{old} (2020)	7	15																																																						

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		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.												
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, Student's 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" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr> <th style="text-align: center;">Parameter</th><th style="text-align: center;">Target precision level</th><th style="text-align: center;">Precision achieved</th></tr> </thead> <tbody> <tr> <td>η_{new}</td><td style="text-align: center;">10%</td><td style="text-align: center;">0.21%</td></tr> <tr> <td>U_y</td><td style="text-align: center;">10%</td><td style="text-align: center;">7.42%</td></tr> <tr> <td>μ_{old}</td><td style="text-align: center;">10%</td><td style="text-align: center;">8.91%</td></tr> </tbody> </table> <p>This has been checked and confirmed by reviewing Survey database and WBT results provided by the CME.</p>	Parameter	Target precision level	Precision achieved	η_{new}	10%	0.21%	U_y	10%	7.42%	μ_{old}	10%	8.91%
Parameter	Target precision level	Precision achieved												
η_{new}	10%	0.21%												
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μ_{old}	10%	8.91%												
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	Not applicable since as assessed above the target level of precision has been achieved.												

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	programmes of activities (Version 08).	
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"> (a) Selected AQL Level (b) Selected UQL Level (c) Selected Consumer Risk Level (d) Selected Producer Risk Level (e) Sample Size chosen for acceptance sampling (f) Acceptance number (c) <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 mechanisms for mitigating these been considered?	Review of sampling records, documented procedure and remote interviews with the Personnel conducted WBT/Surveys does not any reveal sources 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?	For the monitoring U_y and μ_{old} 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.

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		<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> <ul style="list-style-type: none"> a) Are the personnel trained and experienced? b) What is the level of supervision and guidance provided to staff? c) Is there a standardized system for data entry and analysis to produce final result? d) Is there a system or process in place to minimize the introduction of errors? e) Is there a system in place to ensure all collected data is processed; f) Are quality checks performed on data entered, for example range checks, g) inconsistency checks, checking of subsamples of data by supervisors; h) is there a system to check for errors, record and report errors reported and document the remedial action taken; i) What is the level of security and type of backup processes to guarantee data integrity, for example methods to prevent fraud and accidental deletion? 	<p>Verification team based on review of provided supporting documents and remote interviews confirms the following:</p> <ul style="list-style-type: none"> ✓ the personnel involved in the WBT/surveys are trained and experienced. ✓ there exists a standardized system for data entry and analysis to produce final result. ✓ there exist a system or process in place to minimize the introduction of errors. ✓ there a system in place to ensure all collected data is processed. ✓ there exists a quality checks of data entered.

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Document information

<i>Version</i>	<i>Date</i>	<i>Description</i>
04.0	6 April 2021	Revision to: <ul style="list-style-type: none"> • Reflect the “Clarification: Regulatory requirements under temporary measures for post-2020 cases” (CDM-EB109-A01-CLAR).
03.0	31 May 2019	Revision to: <ul style="list-style-type: none"> • Ensure consistency with version 02.0 of the “CDM validation and verification standard for programmes of activities” (CDM-EB93-A08-STAN); • Make structural and editorial improvements.
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.
Decision Class: Regulatory Document Type: Form Business Function: Issuance Keywords: programme of activities, verifying and certifying		