

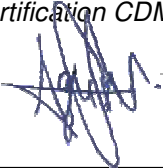


**Verification and certification report form for
CDM programme of activities
(Version 04.0)**

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)	Man and Man Enterprise Improved Cooking Stoves CDM Programme in Ghana supported by Republic of Korea UNFCCC reference number: 10430		
Version number(s) of the PoA-DD(s) to which this report applies	2.0		
Version number of the verification and certification report	1.0		
Completion date of the verification and certification report	22/06/2021		
Monitoring period number and duration of this monitoring period	Monitoring period number: 3 Duration of Monitoring Period: 14/12/2019 - 31/12/2020		
Number and version number of the monitoring report to which this report applies	Number: 1 Version: 1.1		
Coordinating/managing entity (CME)	AERA GROUP S.A.S.		
Host Parties	Host Parties of the PoA	Is this a host Party to a CPA covered in this report? (yes/no)	
	Ghana	Yes	
Applied methodologies and standardized baselines	AMS-II.G.: "Energy efficiency measures in thermal applications of non-renewable biomass" (Version 08.0)		
Mandatory sectoral scopes	Sectoral Scope 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	374,551 tCO ₂ e		
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
	0	330,753 tCO ₂ e	0
Name and UNFCCC reference number of the DOE	LGA Technological Center, S.A. (Applus+ Certification) UNFCCC Ref. No.: E-0032		

<p>Name, position and signature of the approver of the verification and certification report</p>	<p>Mr. Agustin Calle de Miguel</p> <p><i>Applus+ Certification CDM Technical Manager</i></p> <p>Signature: </p>
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SECTION A. Executive summary

The coordinating managing entity/project participant, AERA GROUP S.A.S., has commissioned the DOE, LGAI Technological Center, S.A. accredited DOE E-0032 (hereinafter referred to as Applus+ Certification or just the DOE) to perform an independent verification of the CDM Programme of Activity “Man and Man Enterprise Improved Cooking Stoves CDM Programme in Ghana supported by Republic of Korea” in Ghana (hereafter referred to as “Programme of Activity” or “PoA”) for the CPAs titled “Man and Man Enterprise Improved Cooking Stoves CDM Programme in Ghana supported by Republic of Korea – CPA001” (UNFCCC reference number: 10430-P1-0001- CP1) and “Man and Man Enterprise Improved Cooking Stoves CDM Programme in Ghana supported by Republic of Korea – CPA002” (UNFCCC reference number: 10430-P1-0002-CP1). The objectives of this verification are to verify and certify emission reductions reported for the specific Component Project Activity (CPAs) for the monitoring period from 14/12/2019 to 31/12/2020 (first and last day included); and to verify that the data reported are complete and transparent.

This report summarizes the findings of the verification of the project, performed on the basis of UNFCCC criteria for CDM, as well as criteria given to provide for consistent project operations, monitoring and reporting.

The scope of the verification process is defined as a third-party independent and objective review and ex-post determination of the monitored reductions in GHG emissions by the Component Project Activities, limited to and against the criteria stated in Article 12 of the Kyoto Protocol, the CDM Modalities and Procedures as agreed in the Marrakech Accords and the relevant decisions by the CDM Executive Board, including the approved baseline and monitoring methodology AMS-II.G. Energy efficiency measures in thermal applications of non-renewable biomass (Version 08.0)^{27/}, the latest version of the CDM Validation and Verification Standard for Programmes of Activities (VVS for PoAs version 02.0)^{14/}, the latest version of the CDM Project Standard for Programmes of Activities (PS for PoAs version 02.0)^{15/} and the latest version of the CDM Project Cycle Procedure for Programmes of Activities (PCP for PoAs version 02.0)^{16/}, as well as any other related methodological tools, guidelines and other regulatory documents adopted by the CMP or the Board.

The verification process takes as a basis the validated Programme Design Document (PoA-DD), version 02, dated 02/10/2019 and registered Component Project Activity Design Document (CPA-DD), version 1.8, dated 27/11/2018¹ and ver. 2.0 dated 02/10/2019² (hereinafter referred to as PoA-DD^{19/} and CPA-DDs^{18,20,21/}, corresponding Validation Reports^{19,18,21/} and Monitoring Report^{20/} (hereinafter also referred to as the final MR).

The verification team has, based on the requirements set up in the CDM Validation and Verification Standard for Programmes of Activities (VVS for PoAs version 02.0)^{14/}, evaluated the provided information focusing on the identification of significant risks and reliability of project monitoring and generation of CERs.

The verification is not meant to provide any consulting towards the CME or authorized participants. However, stated requests for clarifications and/or corrective actions may have provided input for improvement of the programme design.

The PoA involves dissemination of improved cooking stoves to household users in Ghana. The PoA saves greenhouse gas emissions by replacing baseline stoves with improved cookstoves. The purpose of the PoA is to mitigate climate change and contribute to sustainable development in Ghana. The CPAs aim to reduce non-renewable wood fuel consumption and greenhouse gas (GHG) emissions of users in a designated area of Ghana by selling affordable Improved Cooking Stoves (ICSs) in replacement of traditional cooking stoves. An ICS combusts wood fuel more efficiently, i.e. requires less charcoal than a traditional stove. This reduces CO₂ emissions. Ecoeye Co., Ltd., and Korea Zinc Co., Ltd. have financed the improved cooking stoves distributed to the households.

This report summarizes the findings of the verification of the project, performed on the basis of VVS for CDM PoAs, ver. 2.0 as well as criteria given to provide for consistent project operations, monitoring and reporting and the subsequent decisions by the CDM Executive Board.

¹ https://cdm.unfccc.int/ProgrammeOfActivities/cpa_db/R71MGTX26FAZ93OE4BWKI80VSUPHCJ/view

² https://cdm.unfccc.int/ProgrammeOfActivities/cpa_db/8OVGJ6T0PLBI3K2RNCY917ZWUFS54X/view

In particular, the monitoring plan, monitoring report and the project's compliance with the 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 PoA-DD^{/19/} and CPA-DDs^{/18,20,21/} and the approved monitoring methodology.

The monitoring report for this monitoring period is in compliance with the monitoring plan of the PoA-DD. The Component Project Activity was registered by applying the small-scale methodology "AMS-II.G. Energy efficiency measures in thermal applications of non-renewable biomass (Version 08.0)"^{/27/} and the verification was carried out in accordance with the applied methodology. It was confirmed during the remote audit that the Component Project Activity during the current verification is in accordance with the applicability criteria of the methodology. It is the responsibility of Applus+ Certification to express an independent GHG verification opinion on the GHG emission reductions and on the calculation of GHG emission reductions for the CPAs for this monitoring period based on the reported emission reductions in the Monitoring Report^{/02/}.

Applus+ Certification's verification approach was based on the requirements as defined under the Kyoto Protocol, Marrakech Accords, as well as those defined by the CDM Executive board. Applus+ Certification's approach was risk-based drawing on an understanding of the risks associated with reported GHG emissions data and the controls in place to mitigate these. The examination includes assessment of evidence relevant to the amounts and disclosures in relation to the project's GHG emission reductions for this monitoring period.

The verification team has planned and performed the work to obtain the information and explanations that are considered necessary to provide sufficient evidence for it to give reasonable assurance that the amount of calculated GHG emission reductions for this monitoring period were fairly stated.

Remote audit and stakeholders' interviews are also performed as part of the verification process.

The programme of activities was correctly implemented according to the selected monitoring methodology, monitoring plan and the registered PoA-DD^{/17/}. 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 audit, the verification team confirms that the CPAs has resulted in the 330,753 tCO₂e emission reductions during the third monitoring period.

Applus+ Certification as a DOE therefore is able to provide a positive verification opinion expressed in the 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.	Lead Auditor Technical Expert (3.1)	OR	KUMAR	PANKAJ	Outsourced Entity (True Quality Certifications Pvt. Ltd.)	X	NA	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 Technical Expert (3.1)	EI	CORTÉS	MIGUEL ÁNGEL	Applus+ Certification
2.	Report Approver	IR	Calle de Miguel	Agustin	Applus+ Certification

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.	<i>Human Error: Recording and reporting of the information in the ER spreadsheet.</i>	<i>Medium</i>	<i>All the ER spreadsheet data of the stoves, including sales database, determination of parameter for efficiency testing including data calculation. This includes all the parameters to be monitored ex-post as per the PoA-DD/CPA-DDs</i>	<p>The risk was mitigated by the training to the personnel involved in data capture, calculation and by following the monitoring responsibilities. The training records were reviewed which was also confirmed during on site visit interviews. Verification team, based on the above, confirms that the risk is appropriately mitigated.</p> <p>Since relevant monitoring parameters were monitored through an ex-post monitoring survey conducted by the CME, the DOE's Verification Team has physically checked:</p> <ul style="list-style-type: none"> • <i>ER sheets and inspection records^{/03/}</i> • <i>Monitoring and sales database^{/05/}</i> • <i>Water boiling test reports^{/06/}</i> • <i>Training certificates of monitoring personnel^{/07/}</i> • <i>Sample stove sales agreement^{/09/}</i> • <i>Water boiling tests^{/26/}</i>
2.	<i>Information System: Use of spreadsheets without adequate controls related to data changes/updates, version tracking, traceability, security.</i>	<i>Medium</i>	<i>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</i>	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

			<i>database and Stove efficiency testing records.</i>	office. The data quality control is maintained by the CME
3.	<i>Accuracy of the measuring equipment</i>	<i>Low</i>	<i>Check the calibration records for the measurement equipment used for efficiency test.</i>	<i>The risk due to accuracy of the measuring equipment shall be ensured by planning to check calibration procedures^{08/} of the measuring equipment used for stove efficiency (water boiling tests) and the QA/QC procedures followed by the laboratory including the capacity of the individuals and the laboratory^{10/} to conduct WBTs.</i>

C.2. Consideration of materiality in conducting the verification

The threshold of materiality was evaluated based on para 13 of “Guideline: Application of materiality in verifications” Version 02.0^{24/} and para 308 of CDM VVS for PoAs, version 02.0^{14/}. It was concluded that the materiality threshold applicable to the project activity based on actual emission reductions achieved is 2% of 330,753 tCO₂e which is equal to 6,615 tCO₂e.

In planning the verification, verification team took cognizance of para 11 and 12 of the “Guideline: Application of materiality in verifications” Version 02.0^{24/}. A materiality threshold of 6,615 tCO₂e is determined in line with para 13(a) of “Guideline: Application of materiality in verifications” Version 02.0^{24/}.

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

1. Monitoring system including the data input procedure
2. Copy of the agreement between household and the CME/ Project Participant (s) (origin of data)
3. Stove unique ID system
4. ER sheet (application of data)
5. Data flow
6. Data control procedures
7. Stove efficiency test (WBT) records^{06/} and applicable QA/QC procedures^{10/}

In conducting the verification, DOE took cognizance of para 13-17 of the “Guideline: Application of materiality in verifications” Version 02.0^{24/} and based on the input of data from different sources checked through sampling of records during the remote interviews observed that no records were found to have inconsistent data from hand written (Copy of the agreement between household and Project Participant) to the electronic monitoring database. Data flow was checked through comparison of data in handwritten forms, electronic database and ER sheet. The training records of the personnel involved in conducting the stove efficiency testing, recording of data and calculation of the emission reductions data has been checked by the verification team^{07/}.

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

Mitigation of Human error risks: The verification team mitigated the risk by checking the training records^{07/} of the personnel during the remote audit. These records have been provided to the verification team by the CME. Furthermore, data was crosschecked with the ER calculation spreadsheet^{04/}, sales and monitoring database^{05/} and the raw data questionnaire^{05/}. Verification team, based on the above, confirms that the risk is appropriately mitigated.

Mitigation due to error in Information system: Verification team by conducting interviews with the personnel responsible for such activities mitigated the risk due to error in information system. It was confirmed through interviews that the raw data is collected by the monitoring team and then transmitted and stored electronically to the CPA implementer's office.

Accuracy of the measuring equipment:

The risk due to inaccuracy in measurements is assessed by reviewing calibration letter^{08/} provided by the laboratory confirming all the project equipment being calibrated. The verification team has reviewed the

dates of calibration and to check whether all equipment is being calibrated at regularly defined intervals as per the registered PoA-DD/CPA-DDs^{/19,18,20,21/}. The risk due to the QA/QC procedures is mitigated through the training^{/07/} of personnel involved in the WBT.

Based on the review of the PoA-DD/CPA-DDs^{/19,18,20,21/}, monitoring report^{/02/}, emission reduction calculation spread sheet^{/04/} and the data provided and the assessment carried out above, Applus+ Certification confirms with a reasonable level of assurance that the claimed emission reductions or removals are free from material errors, omissions or misstatements.

SECTION D. Means of verification

D.1. Desk/document review

The verification was performed primarily based on the review of the monitoring report 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, paying particular attention to the frequency of measurements, and the QA/QC procedures, and an evaluation of data management and the QA/QC system in the context of their influence on the generation and reporting of emission reduction.

Thereof, Applus+ Certification has performed a Document Review (Desk Review) taking in consideration:

- A review of presented data and information to verify its completeness.
- A review of the monitoring plan, the monitoring methodology including applicable tool(s) and, where applicable, the applied standardized baseline and any other regulatory document, paying particular attention to the frequency of measurements, the quality of metering equipment including calibration requirements, and the quality assurance and quality control procedures.
- Cross-checks between the presented data and information provided in the PoA-DD, CPA-DD, CPA-MR, GHG data and emission reductions and information from other sources, including, but not limited to, the publicly available information in the UNFCCC.
- The sectoral and local expertise of the DOE at the time of reviewing the provided data and information.

The initial Monitoring Report^{/15/} version 1.0, dated on 07/12/2020 submitted by the CME and additional background documents related to the emission reductions are reviewed as an initial step of the verification process. The subsequent step has involved the identification of corrective action requests and clarification requests (CARs and CLs) and Forward Actions Requests (FARs) which are presented in the Appendix 4 of this report.

As a result of these findings, the initial MR is revised to final MR version 1.1^{/02/}, dated on 22/06/2021.

The references of the reviewed documentation can be observed under the Appendix 3 of this report.

D.2. On-site inspection

Duration of on-site inspection ³ : 08/03/2021				
No.	Activity performed on-site	Site location	Date	Team member
1.	<p>The verification team conducted remote audit to confirm the information and to resolve issues identified in the document review.</p> <p>A remote audit was conducted as a part of verification activity and has involved:</p> <ol style="list-style-type: none"> 1) An assessment of the implementation and operation of the CDM Programme of Activities based on registered Monitoring Plan and physical features as per the approved PoA-DD/CPA-DD. 2) A review of information flows for generating, aggregating and reporting of the monitoring parameters. 3) Interviews with relevant personnel to confirm that the operational and data collection procedures are implemented in accordance with the Monitoring Plan, as well as to confirm the competency of the operating/monitoring personnel and any calibration agency involved. 4) A cross-check between information provided in the MR, the physical implementation of the CPA and data from other sources. 5) A check of the monitoring equipment including calibration performance, and observations of monitoring practices against the requirements of the approved PoA-DD/CPA-DD, the applied methodology and any other regulatory document. 6) A review of calculations and assumptions made in determining the GHG data and ERs. 7) An identification of QA/QC procedures in place to prevent, or identify and correct, any errors or omissions in the reported monitoring parameters. 8) Assessment of the implementation status of the Programme of Activities as per the approved PoA-DD / CPA-DD. 9) Interaction with CME to assess the implementation of the Monitoring Plan: 	Remote Audit	08/03/2021	Mr. Pankaj Kumar

³ The verification was conducted remotely by the verification team assigned by Applus+ Certification. The alternate measures were adopted in accordance with the communication from the UNFCCC secretariat for the COVID-19 pandemic, *i.e.* relaxation on the mandatory site visits. Based on the undertaking provided by CME^{11/} on the commitment under Korean Emission Trading Scheme (K-ETS), in accordance with the UNFCCC communication, the site visit was not suitable to be postponed and then has not been conducted.

	Interview with ICS users and stakeholders; Verification of baseline; Operation and maintenance; Procedures; and Technical details.			
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D.3. Interviews

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1.	Yaw Agyei	Michael	CEO, Man and Man Enterprises	08/03/2021	CPA background and implementation, ICS types and distribution, monitoring activities and record keeping	Mr. Pankaj Kumar
2.	Dunod	Alexandre	Head – Certification and deliverables (AERA)			
3.	Toe	Jokhanan	Project Developer, AERA		Ex-post monitoring surveys (WBT and Usage Survey)	
4.	Namoe	Rita	KNUST		Programme Design, Baseline fuel usage, sampling approach, results and ER calculations	
					Efficiency test of stoves	Mr. Pankaj Kumar

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4.	Yeboah	Sussana	House holds	20/03/2021	Project implementation and operation, Sales / Distribution records	Mr. Pankaj Kumar
5.	Adu	Gyamfi				
6.	Bamba	Anassane				
7.	Selina	0				
8.	Nyarko	Cindy				
9.	Mansah	Afia				
10.	Jeshua	Adepa				
11.	Rejoice	0				
12.	Afia	Kese				
13.	Narti	Kofi				
14.	Dennis	Afful				
15.	Kofi	Alex				
16.	Hotor	Afia				
17.	Kingsley	Boateng				

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18.	Victor	Appiah	Households	25/03/2021	Project implementation and operation, Sales / Distribution records	Mr. Pankaj Kumar
19.	Amaoko	Precious				
20.	0	Mansah				
21.	Cecilia	Baafi				
22.	Joseph	Ankapong				
23.	0	Jannifer				
24.	Veronica	Twumasi				
25.	Yakubu	0				
26.	Joel	Nabatra				

27	Kojo	Benjamin				
28	Dawani	Adwoa				
29	Emmanuel	Amoateng				
30	Juliana	0				
31	Celilia	Addai				

D.4. Sampling approach

The sampling plan implemented by the CME is in accordance with the applied approved monitoring methodology^{/27/} and the approved revised PoA-DD^{/19/} and CPA-DDs^{/18,20,21/}. The CME has appropriately performed simple random sampling in accordance with the applied methodology^{/27/} and the monitoring plan provided in the PoA-DD^{/19/} and the CPA-DDs^{/18,20,21/}.

The sampling survey has been carried out by the well-trained personnel of Man and Man Enterprises and AERA Group and WBT tests were performed by KNUST (third party). Training certificates of the personnel has been provided to the verification team^{/07/}. Monitoring parameters $N_{y,i,j}$ and μ_y are monitored through monitoring surveys by the monitoring personnel of CPA implementer. Monitoring parameter $\eta_{new,i,j}$ is monitored through conducting the water boiling tests to determine the efficiency of the installed stoves. Monitoring of the parameter ensures compliance to the para 41 of the methodology AMS-II.G, version 08^{/27/}. Verification team has checked the water boiling test records^{/06/} to confirm the test results. The thermal energy generated by the project technology has also been determined in the section C.1 of the MR^{/02/} and the ER sheet^{/04/} in order to comply with the para 24 of the methodology^{/27/}. Parameter μ_y monitors the adjustment to account for any continued use of pre-project devices during the year of the monitoring period. The monitoring of the parameter μ_y ensures the compliance to the requirements to the para 40 of the monitoring methodology, AMS-II.G, version 08^{/27/}. Parameter $N_{y,i,j}$ monitors Number of project devices of type i and batch j operating during year y . The value of the parameter is determined by multiplying all devices sold (N) with the proportion of cooking stoves found to be operating in a representative sample, i.e. pop_stoves,y . The value of the parameter pop_stoves,y is determined through monitoring surveys.

CME has done a sampling for the PoA and the CPAs reported in the monitoring period, CPA 1 and CPA 2 for the current monitoring period. The sample sizes have been calculated based on the expected proportion values available from the previous monitoring period (MP-2). This is acceptable to the verification team since the estimates are based on result of previous studies and based on the researcher's own experiences. This is in accordance with the para 5 (a) and (c) of the Appendix 1 of the Sampling Guidelines version 4.0 (EB 86 Annex 4)^{/22/}.

DOE used sampling during verification for checking the operational status, the proportion of meals cooked on the project cookstoves, dates of commissioning of the project devices/ batches at the households, number of project devices in a household and to check if the WBT tests have been done for the households and all the households confirmed that the WBT tests were conducted for their households. Interviews were conducted with all the households for the stoves for whom WBTs were conducted and it was confirmed that the WBTs were performed on their stoves. The serial numbers of the stoves were also confirmed through interview with the KNUST laboratory personnel during a telephonic interview^{/10/}.

In line with the Standard for "Sampling and surveys for CDM project activities and programmes of activities" version 09.0^{/23/}, Paragraph 26, the verification team has applied a sampling approach for remote audit as part of the verification process. Now as the CME has applied sampling approach, the verification team has chosen acceptance sampling in accordance with the Standard for "Sampling and surveys for CDM project activities and programmes of activities" version 09.0^{/23/}, Paragraph 28.

Since estimated volume of annual GHG emission reductions of the project activity or the PoA being verified is equal to or less than 100,000 tCO₂e, applying paragraph 39 (a) of the Standard for "Sampling and surveys for CDM project activities and programmes of activities" version 07^{/23/}, a sample size of 14 households was chosen (with no discrepant records). A sample size of 14 was required, based on an AQL of 1.0 % and UQL of 20 %, producer risk 5 % and consumer risk 20 %. Acceptance number (c) thus determined for the sample is 1. DOE interviewed 14 samples. It was observed that out of the 14 samples, 13 stoves were found to be operational and 1 stove was non-operational, and this matched with the CME's records and hence no discrepant records were observed with the published MR^{/01/} and ER sheet^{/04/} and thus $c=1$ level of maximum discrepancies for the set of records is complied. Thus, CME's set of records has been accepted in line with the Standard for "Sampling and surveys for CDM project activities and programmes of activities" version 07.0^{/23/}, Paragraph 38. Verification team has cross verified these sampling documents during the remote audit.

The sampling plan implemented by the CME is in accordance with the PoA-DD^{/19/} / CPA-DD^{/18,20,21/} as well as the CME has appropriately performed Simple Random Sampling procedure in line with the applied approved monitoring methodology^{/5/}. As the registered PoA-DD^{/19/} mentions the option for Simple Random Sampling procedure, it is acceptable to the verification team.

The dates of commissioning of the project devices/batches at the households and number of project devices in a household were also consistent with the monitoring database and sampling database respectively and only one discrepancy was found (*i.e.* c=1 level of maximum discrepancies for the set of records is complied). Thus, CME's set of records has been accepted in line with para 33 of the sampling standard, version 09^{/23/}.

DOE checked the water boiling test report^{/06/} with records of all the sampled stoves for the verification of the stove efficiency of the project stove.

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	-	03	-
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	-	-	-
• Corrections	-	-	-
• Inclusion of a monitoring plan	-	-	-
• Permanent changes to the registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines, or other methodological regulatory documents ⁴	-	-	-
• Changes to the programme design	-	-	-
• Addition of CPA inclusion template	-	-	-
• Change of coordinating/managing entity	-	-	-
• 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	-	-	-

⁴ 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 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	-	01	-
Compliance with the calibration frequency requirements for measuring instruments	-	-	-
Assessment of data and calculation of emission reductions or net removals	-	01	-
• 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)- One FAR was raised during previous verification regarding discrepancy in monitoring survey questionnaire	-	-	01 (from previous Verification)
Total	01 CL	05 CARs	01 FAR

SECTION E. Verification findings

E.1. General

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

Means of verification	The verification team determined whether the monitoring report was completed using the valid version of the applicable monitoring report form. The verification team has checked whether all the sections of the monitoring report follow the guidelines provided in the template itself.
Findings	There are no findings on this section of the report
Conclusion	<p>The verification team concludes that the monitoring report provides all the information in accordance with the valid version of the CDM-PoA-MR-FORM (version 04.0)^{9/} and the instructions therein for filling it.</p> <p>The monitoring report has been prepared in line with VVS-PoA, version 02.0^{1/}. This confirms compliance with the para 337 and para 338 of CDM VVS for PoAs, version 02^{14/}.</p>

E.1.2. Remaining forward action requests from validation and/or previous verifications

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The verification team has reviewed the validation report and previous verification reports and observed that one FAR was raised during verification of previous monitoring period which was closed successfully during verification. According to the FVR of monitoring period 2 (2019 year), FAR was related to amendment in

monitoring survey questionnaire. CME took care of the same for current monitoring period. Verification team checked the revised questionnaire for monitoring survey and confirms that FAR is closed.

The DOE has not raised a forward Action Request (FAR) during this verification process.

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)
Man and Man Enterprise Improved Cooking Stoves CDM Programme in Ghana supported by Republic of Korea – CPA001 (UNFCCC reference number: 10430 -P1-0001-CP1)	Yes	30/11/2018	2.0	Yes
Man and Man Enterprise Improved Cooking Stoves CDM Programme in Ghana supported by Republic of Korea – CPA002 (UNFCCC reference number: 10430-P1-0002-CP1)	Yes	10/06/2019	2.0	Yes

E.2. Programme of activities

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

Means of verification	The verification team determined the conformity of the actual component project activities and their operation with the registered programme design document and CPA-DDs. Applus+ Certification has, by means of a desk review and remote audit, assessed that all physical features of the component project activities in the registered PoA are in place, and that the Coordinating/Managing Entity has operated the CPAs as per the registered PoA-DD ^{/19/} and CPA-DDs ^{/18,20,21/} .
Findings	There are no findings on this section of the report
Conclusion	<p>The verification team by means of remote audit and document review concludes that the component project activity was implemented and operated as per the registered PoA-DD^{/19/} and validated CPA-DDs^{/18,20,21/} and that all physical features of the project are in place.</p> <p>Site visit could not be postponed due to delivery commitment and huge financial implications as confirmed based on the undertaking^{/11/} from the CME provided due to commitment for the Korean Offset credits (KOCs) under the K-ETS, It was</p>

	<p>determined that the site visits cannot be postponed due to the CER delivery commitment by CME.</p> <p>Hence in view of above and COVID-19 pandemic, DOE decided to conduct remote audit. Through remote audit, verification team was able to confirm that the implementation of Programme of Activities (PoA) and the Component Project Activities (CPAs) is in accordance with the project description contained in the revised approved PoA-DD of 02/10/2019^{/19/} and respective CPA-DDs^{/18,20,21/}.</p> <p>A remote audit was conducted by Applus+ certification in accordance with the communication from CDM Executive Board to relax mandatory site visits by DOEs until 31/12/2021 because of COVID-19.</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>Accordingly, as prescribed in the communication from CDM EB, the steps provided in the para 10.1.3 of the VVS for the PoAs, version 02^{/14/}, DOE confirmed that project equipment are same and no change in the project design, baseline scenario and monitoring procedures as compared to registered PoA DD^{/19/}.</p>
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E.2.2. Implementation and operation of the management system

Means of verification	<p>The verification team determined the roles and responsibilities, training arrangements and capacity development, procedure for technical review of inclusion of CPA's, data management responsibilities, detailed record-keeping system for the CPA under the PoA, and how the process performance documentation and relevant evidences are explained in the CPA-DDs^{/18,20,21/}.</p>
Findings	There are no findings on this section of the report
Conclusion	<p>Verification team evaluated the management systems in place to implement the monitoring of the component project activities.</p> <p>This included the management structure, records and document control process, procedures for training, continuous improvement of the PoA management system, record keeping system, procedures for double counting.</p> <p>The PoA management system including the record-keeping system and the management structure has been explained in section C of the registered PoA-DD^{/11/}. During the course of verification, verification team based on review of section B.1 of the monitoring report, supporting documents and interview/observation has assessed this management system.</p> <p>The verification team confirms that the monitoring management systems and processes of the CDM PoA are in place; with the responsibilities properly identified; recording processes in place; a procedure for review of inclusion of CPAs established; a procedure to avoid double counting; and measures for continuous improvements; as described in the PoA-DD^{/11/}.</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 para 340 (a) , para 32 (b) (iv) and para 347 (b) (iv) of CDM VVS PoAs, ver.02.0^{/14/}.</p>

E.2.3. Post-registration changes

E.2.3.1. Corrections

>>

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

>>

PRC-10430-001 was approved on 15/12/2019 for the changes in the PoA-DD. The changes are detailed in the section B.2.3 of MR^{/02/}.

E.2.3.4. Changes to the programme design

>>

There are no changes to the programme design or project design 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.2.3.5. Addition of CPA inclusion template

>>

There is no addition of CPA inclusion template in the PoA.

E.2.3.6. Change of coordination/managing entity

>>

Not applicable

E.2.3.7. Changes specific to afforestation and reforestation activities

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Not applicable As this is not a afforestation and reforestation activity.

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

Means of verification	The verification team determined how the generic CPA is part of a PoA-DD and checked how each technology/measure, methodology and combination thereof, or that technologies/measures have been combined in one generic CPA-DD in accordance with the relevant requirements in the “CDM project standard for programmes of activities, version 02.0” ^{/15/} .	
Findings	There are no findings on this section of the report	
Conclusion	The implementation status of the PoA and the CPAs are:	
	CME/ Project Participants	AERA Group S.A.S
	Title of PoA	Man and Man Enterprise Improved Cooking Stoves CDM Programme in Ghana supported by Republic of Korea
	UNFCCC registration no.	10430
	Applied Baseline and Monitoring methodology	AMS-II.G, version 08 ^{/27/}
	Title of the CPA	CPA001- Man and Man Enterprise Improved Cooking Stoves CDM Programme in Ghana supported by Republic of Korea

CPA reference no.	10430-P1-0001-CP1
Date of inclusion	30/11/2018
CPA start date	20/10/2017
CPA start of operation	04/06/2018
CPA implementor	Man and Man Enterprises; ECOEYE Co. Ltd.
Project scale	Small scale
Location of the CPAs	Ghana
CPA crediting period	30/11/2018 – 29/11/2025
Reported monitoring period verified in this verification	14/12/2019 to 31/12/2020 (3 rd monitoring period)

Title of the CPA	CPA002- Man and Man Enterprise Improved Cooking Stoves CDM Programme in Ghana supported by Republic of Korea
CPA reference no.	10430-P1-0002-CP1
Date of inclusion	10/06/2019
CPA start date	22/02/2019
CPA start of operation	22/02/2019
CPA implementor	Man and Man Enterprises; ECOEYE Co. Ltd.
Project scale	Small scale
Location of the CPAs	Ghana
CPA crediting period	10/06/2019 – 09/06/2026
Reported monitoring period verified in this verification	14/12/2019 to 31/12/2020 (3 rd monitoring period)

The two CPAs (10430-P1-0001-CP1 and 10430-P1-0002-CP1) under Verification involve the distribution of improved cooking stoves in the host country Ghana. CPA001 (10430-P1-0001-CP1) is located in the Brong Ahafo region of the host country Ghana and CPA002 (10430-P1-0002-CP1) is located in the Eastern region of the host country Ghana. The coordinating/managing entity for the PoA is AERA GROUP S.A.S. The CPA implementers for the CPA 001 and CPA 002 are Man and Man Enterprise and ECOEYE CO., LTD. The technology type used under this CPA is the Jiko-type ICS. This is in accordance with the para 340 (a) of the VVS for the PoAs, version 02.0^{14/} and the CPAs are reported in this batch in the monitoring report.

The numbers of stoves deployed under each CPA has been confirmed through the review of the sales database^{04/}. The verified^{04/} total number of stoves deployed (implemented) under the CPA001 are 166,421 and under CPA002 are 182,188. The stoves are being manufactured by the Man and Man Enterprise.

As per the registered CPA-DDs^{18,20,21/}, the CPAs qualify as a microscale project type II which CDM units aims to achieve energy savings at a scale of no more than 600 MWh per year, which is equivalent to 1,800 MWhth of annual energy savings per appliance. The annual thermal energy savings from the CPA001 and CPA 002 is less than the threshold limit. Thus the total energy savings from the CPA is less than the microscale threshold in the CPA-DDs^{18,20,21/18,20,21/} and the methodology AMS-II.G, version 08^{27/}.

It was confirmed during the remote audit that AERA GROUP S.A.S. is the Coordinating/Managing Entity for the PoA and Man and Man Enterprise and ECOEYE CO., LTD are the CPA implementers for CPA 1 (10430-P1-0001-CP1) and CPA 2 (10430-P1-0002-CP1). The actual CPAs are in line with the registered/ included CPA-DDs^{18,20,21/18,20,21/}.

The information (including data and variables) provided in the MR^{02/} is in line with the details provided in the included/registered CPA-DDs^{18,20,21/18,20,21/}.

Verification team considers the project description of the project contained in the approved revised PoA-DD^{19/} and CPA-DD^{18,20,21/} to be complete and accurate.

	<p>The CPA-DD complies with the relevant methodology^{/27/}, tools, forms and guidance at the time of CPA-DD submission for registration/inclusion. The CPA-DDs comply with the relevant methodology, tools, forms and guidance at the time of CPA-DDs submission for registration/inclusion. The CPAs have been implemented in accordance with the registered CPA-DDs^{/18,20,21/}.</p> <p>Applus+ Certification confirms that monitoring period is reasonable and the operation of the CPAs is in accordance with the registered CPA-DDs and in compliance with para 340, 341 and 342 of the CDM VVS for PoA, ver. 02^{/14/}. Verification team conducted remote audit in line with the para 320 and 321 of the CDM VVS for PoAs, ver. 02.0^{/14/}.</p>
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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

>>

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 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.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 CPA.

E.3.2.4. Inclusion of a monitoring plan

>>

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

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

>>

PRC-10430-002 was approved on 19/12/2019 for the changes in the CPA-DD. The changes are detailed in the section C.3.5 of the MR^{/02/}.

E.3.2.6. Changes to the project design

>>

There are no changes to the project design 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.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	The verification team determined whether the registered monitoring plan is in accordance with the applied methodology ^{/27/} including applicable tools and any other related regulatory document.
Findings	There are no findings on this section of the report
Conclusion	The verification team is able to confirm that the monitoring plan contained in the registered CPA-DDs ^{/18,20,21/} is in accordance with the approved methodology applied by the project activity, i.e. AMS-II.G, version 08 ^{/27/} . The monitoring plan is in accordance with the approved methodology, AMS-II.G, Version 08 ^{/27/} , applied by the component project activities and as provided in the CPA-DD ^{/18,20,21/} . The verification took cognizance of para 357 to para 359 of CDM VVS for PoAs, Version 02.0 ^{/14/} .

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

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

Means of verification	The verification team has determined whether all ex-ante parameters used for emission reduction calculation stated in the registered monitoring plan are used appropriately as per the registered CPA-DDs ^{/18,20,21//18,20,21/} .
Findings	There are no findings on this section of the report
Conclusion	Verification team confirms that the Data and parameters fixed ex ante are in compliance with the registered CPA-DDs ^{/18,20,21/} and the monitoring plan. Please refer Appendix 5 for detailed analysis of the ex-ante parameters. The verification took cognizance of para 360 and 372 of CDM VVS for PoAs, Version 02.0 ^{/14/} .

E.3.4.2. Data and parameters monitored

Means of verification	The verification team has determined whether the registered monitoring plan has been properly implemented and followed by the CME and that the monitoring has been carried out in accordance with the registered monitoring plan.
Findings	CL 01 has been raised in this regard and has been resolved
Conclusion	<p>In MR v01, though the source of parameter $\eta_{new,i,j}$ (Efficiency of the device of each type) mentioned but no supporting evidence was provided. Upon raising the CL 01, CME has provided water boiling test report received from the laboratory as supporting evidence and subsequently this CL 01 has been resolved.</p> <p>The verification team confirms that the data and parameters monitored are in compliance with the registered CPA-DDs and the monitoring plan. A complete assessment of each of the monitored parameters has been provided in Appendix 6 of the verification report.</p> <p>The verification team confirms the compliance of para 346,347(c) ,357 and 359 of CDM VVS for PoAs, ver. 02.0^{/14/}.</p>

E.3.4.3. Implementation of sampling plan

Means of verification	The verification assessed whether there has been compliance of the sampling efforts and surveys with the registered sampling plan in accordance with the UNFCCC CDM Guideline for "Sampling and surveys for CDM project activities and programmes of activities" version 04.0 ^{/22/} and if CME has applied a sampling approach to determine data and parameters monitored.
Findings	CAR 05 has been raised in this regard.

<p>Conclusion</p>	<p>In MR v01, the sampling plan description was not clear and not in line with the applied methodology, hence CAR 05 has been raised; in MR v02, CME has explained the sampling plan in section E.3 of MR; accordingly, CAR 05 has been closed.</p> <p>CME has done a sampling for the PoA and the CPAs reported in the monitoring period, CPA 1 and CPA 2 for the current monitoring period. The sample sizes have been calculated based on the expected proportion values available from the previous monitoring period (MP-2). This is acceptable to the verification team since the estimates are based on result of previous studies and based on the researcher's own experiences. This is in accordance with the para 5 (a) and (c) of the Appendix 1 of the Sampling Guidelines version 4.0 (EB 86 Annex 4)^{/22/}.</p> <p>DOE confirmed that, CME has taken sample size for all the parameters in line with para 13 of Standard for sampling and surveys for CDM project activities and programme of activities, ver. 7.0^{/23/}. CME has provided transparent description in sec. E.3 of MR in line with validated sampling plan and sampling procedures described in registered PoA-DD^{/17/} and CPA-DDs^{/18,20,21/} in compliance with para 320 (c) of VVS for PoA, Ver. 02.0.</p> <p>Sampling survey conducted by in house trained team of CME and CPA implementor and WBT tests conducted by KNUST (3rd party). Monitoring parameters $N_{y,i,j}$ and $\mu_{y,i,j}$ monitored through monitoring surveys by the CPA implementor. Monitoring parameter $\eta_{new,i,j}$ is monitored through conducting the water boiling tests (WBTs) to determine the efficiency of the installed stoves. Monitoring of the parameter ensures compliance to the para 41 of the methodology AMS-II.G, version 08^{/27/}. Verification team has checked the water boiling test records^{/06/} to confirm the test results.</p> <p>Parameter $\mu_{y,i,j}$ monitors the adjustment to account for any continued use of pre-project devices during the year of the monitoring period. The monitoring of the parameter $\mu_{y,i,j}$ ensures the compliance to the requirements to the para 40 of the monitoring methodology, AMS-II.G, version 08^{/27/}. Parameter $N_{y,i,j}$ monitors Number of project devices of type i and batch j operating during year y. The value of the parameter is determined by multiplying all devices sold (N) with the proportion of cooking stoves found to be operating in a representative sample, i.e. $pop_stoves_{y,i,j}$. The value of the parameter $pop_stoves_{y,i,j}$ is determined through monitoring surveys.</p> <p>CME has done sampling based on registered PoA^{/19/} and CPAs^{/18,20,21/} for the monitoring period of CPA 1 and CPA 2. A sample size of 12 was determined for the parameter $N_{y,i,j}$ (CPA001 & CPA002) based on the required confidence interval / precision level of 90/10, this sample size was increased to 101 and 106 for CPA 0001 and CPA 0002 respectively in order to meet the lower responses in accordance with the requirements of sampling standard^{/23/}. The sample size determined for the parameter $\mu_{y,i,j}$ based on the required confidence interval/precision level of 90/10 is 52 (CPA0001) and 106 (CPA 0002). The sample size determined is more than 30 in both the cases and this in accordance with para 13 of the sampling standard, ver. 07^{/23/}, meets the minimum sample size requirements of 30 when the parameter of interest is a proportion.</p> <p>The precision achieved for the parameter $N_{y,i,j}$ ($pop_stoves_{y,i,j}$) is 2 % (for CPA 001) and 2 % (for CPA 002) and thus within the limits of 10% required precision for the parameter. The precision achieved for the parameter $\mu_{y,i,j}$ is 8 % (for CPA 001) and 6 % (for CPA 002), the precision achieved for CPA 001 is thus within the limits of 10% required precision for the parameter.</p> <p>A sample size of 2 (for both CPA 001 and CPA 002) was determined for the parameter $\eta_{new,i,j}$ based on the required confidence interval/precision level of 90/10. A sample of 2 was thus chosen to account for the non-responses and WBTs were conducted on 3 stoves of CPA 001 of 2018 age group, 1 for both CPA0001 2019 and 2020 age group and 2 stoves were tested for each CPA0002 age group.</p>
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	<p>Since this parameter is a mean type and thus t-distribution calculations have been used in case of a sample size less than 30.</p> <p>DOE used sampling during verification for checking the operational status, the proportion of meals cooked on the project cookstoves, dates of commissioning of the project devices/ batches at the households, number of project devices in a household and to check if the WBT tests have been done for the households and all the households confirmed that the WBT tests were conducted for their households. Interviews were conducted with all the households for the stoves for whom WBTs were conducted and it was confirmed that the WBTs were performed on their stoves. The serial numbers of the stoves were also confirmed through interview with the KNUST laboratory personnel during a telephonic interview^{10/}.</p> <p>In line with the Standard for "Sampling and surveys for CDM project activities and programmes of activities" version 09^{23/}, Paragraph 26, the verification team has applied a sampling approach for remote surveys as part of the verification process. Now as the CME has applied sampling approach, the verification team has chosen acceptance sampling in accordance with the Standard for "Sampling and surveys for CDM project activities and programmes of activities" version 09.0^{23/}, Paragraph 28.</p> <p>Since estimated volume of annual GHG emission reductions of the project activity or the PoA being verified is equal to or less than 100,000 tCO₂e, applying paragraph 39 (a) of the Standard for "Sampling and surveys for CDM project activities and programmes of activities" version 07^{23/}, /, a sample size of 14 households was chosen (with no discrepant records). A sample size of 14 was required, based on an AQL of 1.0 % and UQL of 20 %, producer risk 5 % and consumer risk 20 %. Acceptance number (c) thus determined for the sample is 1. DOE interviewed 14 samples. It was observed that out of the 14 samples, 13 stoves were found to be operational and 1 stove was non-operational, and this matched with the CME's records and hence no discrepant records were observed with the published MR^{01/} and ER sheet^{04/} and thus c=1 level of maximum discrepancies for the set of records is complied. Thus, CME's set of records has been accepted in line with the Standard for "Sampling and surveys for CDM project activities and programmes of activities" version 07.0^{23/}, Paragraph 38. Verification team has cross verified these sampling documents during the remote verification.</p> <p>The sampling plan implemented by the CME is in accordance with the PoA-DD^{19/} / CPA-DDs^{18,20,21/} as well as the CME has appropriately performed Simple Random Sampling procedure in line with the applied approved monitoring methodology^{27/}. As the registered PoA-DD^{19/} mentions the option for Simple Random Sampling procedure, it is acceptable to the verification team.</p> <p>The dates of commissioning of the project devices/ batches at the households and number of project devices in a household were also consistent with the monitoring database and sampling database respectively and only one discrepancy was found (<i>i.e.</i> c=1 level of maximum discrepancies for the set of records is complied). Thus, CMEs set of records has been accepted in line with para 38 of the sampling standard, version 09^{23/}.</p> <p>DOE checked the water boiling test report^{06/} with records of all the sampled stoves for the verification of the stove efficiency of the project stove.</p> <p>The implementation of sampling plan and results of DOE's sampling are thus acceptable to the assessment team.</p>
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E.3.5. Compliance with the calibration frequency requirements for measuring instruments

Means of verification	<p>The verification team determined whether the calibration of the measuring equipment that has an impact on the claimed emission reductions is conducted by the CME at a frequency specified in the registered monitoring plan.</p>
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Findings	There are no findings on this section of the report
Conclusion	Sales and distribution database ^{05/} has been used to record the stove details by the CME and a monitoring survey of the installed stoves based on sampling basis. The stove efficiency also needs to be checked. The stove efficiency testing has been done by WBTs conducted in line with the guidance provided by the CME in the CPA-DD ^{18,20,21/} . The WBTs have been performed by trained personnel of the efficiency test laboratory in KNUST, a science and technology University located in Kumasi, Ghana. The laboratory has been set up by UNDP and Approvecho Research Center, USA (http://aprovecho.org). The equipment has been calibrated in accordance with the installer guidelines and confirmed in the letter ^{08/} provided to the verification team. Capacity of the laboratory and the credentials of the personnel involved in WBT ^{10/} have been provided to the verification team thus the QA/QC compliance of the monitoring parameter is confirmed. The verification took cognizance of section 10.2.6 of CDM VVS for PoAs, version 02.0 ^{14/} .

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

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

Means of verification	The verification team assessed whether the data and calculations of baseline emissions resulting from the registered CPA-DDs are correct. The verification team has checked whether calculations of baseline GHG emissions have been carried out in accordance with the formulae and methods described in the registered monitoring plan.
Findings	There are no findings on this section of the report
Conclusion	<p>In line with the requirement of para 357 and 358 of CDM VVS for PoAs, Version 02.0, the verification team has reviewed the Monitoring report and ER spread sheet to check the arithmetic calculation of the emission reductions. The equation used for the calculation is compared with those provided in the registered CPA-DD^{18,20,21/} and the methodology AMS-II.G, Version 08^{27/} and found to be correct.</p> <p>The equations for baseline emissions as provided in the monitoring report^{02/} were confirmed with the registered CPA-DD^{18,20,21/} and the methodology AMS-II.G, version 08^{27/} and found to be correct.</p> <p>Emission reductions are calculated using the below equation:</p> $ER_y = \sum_i \sum_j ER_{y,i,j} - LE_y \quad \text{Equation (1)}$ <p>Where:</p> <ul style="list-style-type: none"> i = Indices for the situation where more than one type of project device is introduced to replace the pre-project devices⁵ j = Indices for the situation where there is more than one batch of project device ER_y = Emission reductions during year y in t CO₂e $ER_{y,i,j}$ = Emission reductions by project device of type i and batch j during year y in t CO₂e LE_y = Leakage emissions in the year y $ER_{y,i,j} = B_{y,savings,i,j} \times N_{y,i,j} \times \mu_y \times f_{NRB,y} \times NCV_{btomass} \times EF_{projected_fossil\ fuel}$

⁵ For example, in some instances, full replacement of the pre-project device would require the implementation of more than one project device (e.g. one stove suitable for cooking and the other stove suitable for cooking/boiling water).

Where:

$B_{y,savings,i,j}$	Quantity of woody biomass that is saved in tonnes per cook stove of type i and batch j during year y
$f_{NRB,y}$	Fraction of woody biomass saved by the project activity in year y that can be established as non-renewable biomass using survey methods or government data or default country specific fraction of non-renewable woody biomass (f_{NRB}) values available on the CDM website ⁶ .
$NCV_{biomass}$	Net calorific value of the non-renewable woody biomass that is substituted (IPCC default for wood fuel, 0.015 TJ/tonne, based on the gross weight of the wood that is 'air-dried')
$EF_{projected_fossilfuel}$	Emission factor for the fossil fuels projected to be used for substitution of non-renewable woody biomass by similar consumers. Use a value of 81.6 tCO ₂ /TJ
$N_{y,ij}$	Number of project devices of type i and batch j operating during year y
μ_y	Adjustment to account for any continued use of pre-project devices during the year y when applying equations 6 and 8 (fraction). Use 1.0 in other cases

$$B_{y,savings,i,j} = B_{old,i,j} \times \left(1 - \frac{\eta_{old,i,j}}{\eta_{new,i,j}}\right)$$

Where:

$\eta_{old,i,j}$	Efficiency of the old devices being replaced by project devices of type i and batch j .
$\eta_{new,i,j}$	Efficiency of the project device i and batch j

 $B_{old,i,j}$ is determined as follows:

$$B_{old,i,j} = B_{old,HH} \div N_{d,HH}$$

$$B_{old,HH} = B_{old,p} \times N_{p,HH}$$

Where:

$B_{old,HH}$	= Annual quantity of woody biomass that would have been used in the household in the absence of the project activity to generate useful thermal energy equivalent to that provided by the project devices (tonnes/household/year)
$N_{d,HH}$	= Number of project devices per household (number)
$B_{old,p}$	= Annual quantity of woody biomass that would have been used per person in the household in the absence of the project activity to generate useful thermal energy equivalent to that provided by the project devices (tonnes/person/year)
$N_{p,HH}$	= Average number of persons per household (number)

$B_{old,i,j}$ is multiplied by a net to gross adjustment factor of 0.95 to account for leakages, in which case surveys are not required.

⁶ Default values endorsed by designated national authorities and approved by the Board are available at <http://cdm.unfccc.int/DNA/fNRB/index.html>

	<p>From the above equation and the parameter values, emission reductions are calculated as:</p> <p>10430-P1-0001-CP1: 160,401 tCO₂e</p> <p>10430-P1-0002-CP1: 170,352 tCO₂e</p> <p>Total ERy = 330,753 tCO₂e</p> <p>The verification team confirms that the calculation of baseline emission and emission reductions is in accordance with the applied methodological equation and the registered CPA-DDs. Calculations have been checked and confirmed from the ER spread sheet^{/04/}. The verification took cognizance of para 358 of CDM VVS for PoAs, version 02.0^{/14/}.</p>
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E.3.6.2. Calculation of project GHG emissions or actual net GHG removals by sinks

Means of verification	There are no project emissions identified in the monitoring methodology.
Findings	There are no findings on this section of the report
Conclusion	There are no project emissions identified in the monitoring methodology and the CPA-DDs ^{/18,20,21/}

E.3.6.3. Calculation of leakage GHG emissions

Means of verification	The verification team assessed whether the data and calculations of leakage emissions resulting from the registered CPA-DDs ^{/18,20,21/18,20,21/} are correct. The verification team has checked whether calculations of leakage GHG emissions have been carried out in accordance with the formulae and methods described in the registered monitoring plan.
Findings	There are no findings on this section of the report
Conclusion	<p>Net-to-gross adjustment factors for NRB leakage (LNRB) and for PoA leakage (PoA) (fixed default values of 0.95 as per AMS-II.G were 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 registered CPA-DDs.</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	CAR 04 has been raised in this regard.
Conclusion	<p>Though CME has mentioned GHG emission reductions in MR v01 along with the ER calculation spread sheet, the baseline emissions and project emission were not clear in the spreadsheet; hence CAR 04 has been raised; CME has provided a revised spread sheet of ER calculations by mentioning baseline and project emissions clearly; hence CAR 04 has been closed.</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 registered CPA-DDs^{/18,20,21/}. The total number of ERs achieved during the monitoring period are 330,753 tCO₂e.</p> <p>In summary, verification team confirms that actual emission reductions are lower than the estimate of the registered (included)/approved CPA-DDs^{/18,20,21/} for the current monitoring period. The verification took cognizance of para 373 of CDM</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
Man and Man Enterprise Improved Cooking Stoves CDM Programme in Ghana supported by Republic of Korea – CPA001 (UNFCCC reference number: 10430- P1-0001-CP1)	423,531	245,503	17,627	0	160,401	160,401
Man and Man Enterprise Improved Cooking Stoves CDM Programme in Ghana supported by Republic of Korea – CPA002 (UNFCCC reference number: 10430- P1-0002-CP1)	499,971	292,415	37,203	0	170,352	170,352
Total	923,502	537,918	54,830	0	330,753	330,753

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	There are no findings on this section of the report
Conclusion	Comparison of the actual GHG emission reductions with the estimates in the included specific CPAs is given in the below table.

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)
Man and Man Enterprise Improved Cooking Stoves CDM Programme in Ghana supported by Republic of Korea – CPA001 (UNFCCC reference number: 10430- P1-0001-CP1)	160,401	246,835
Man and Man Enterprise Improved Cooking Stoves CDM Programme in Ghana supported by Republic of Korea – CPA002 (UNFCCC reference number: 10430- P1-0002-CP1)	170,352	127,716
Total	330,753	374,551

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

Means of verification	Document Review
Findings	There are no findings on this section of the report
Conclusion	<p>Verification team confirms that actual emission reductions are lower than the estimate of the registered (included)/approved CPA-DDs^{/18,20,21/} for the current monitoring period. The total ERs for the monitoring period are 330,753 tCO₂e and the ex-ante ERs for the monitoring period were 374,551 tCO₂e.</p> <p>The actual GHG emission reductions achieved in CPA001 for current monitoring period are less than the ex ante estimation in the included CPA001, hence conservative. DOE confirmed that ER from CPA1 are lower than expected ex-ante values due to the fact that less stoves were distributed (166,421 stoves distributed during the CPA001), against 273,000 stoves expected to be distributed by 31/12/2020</p> <p>However, for CPA002 are higher than what was estimated ex-ante. This is mainly due to the fact that more stoves (182,188 stoves distributed during the CPA) against 78,000 stoves expected to be distributed under this CPA by 31/12/2020</p> <p>Overall, the total ERs for the monitoring period are less than the estimated ex-ante for both the CPAs.. The verification took cognizance of para 270 and 271 of the CDM Project Standard for the PoAs version 02.0^{/15/}</p> <p>As actual emission reductions are less than the estimated ERs for the monitoring period, verification team confirmed the ERs value is conservative.</p>

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

Means of verification	NA
Findings	NA
Conclusion	NA

E.3.8. Global stakeholder consultation

Means of verification	The project MR ^{/01/} was webhosted on UNFCCC website
Findings	There are no findings on this section of the report
Conclusion	The project MR ^{/01/} was webhosted on UNFCCC website. No comments were

	received during the public availability period.
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SECTION F. Internal quality control

As a final step for Verification assessment, the final documentation, including the Verification Report, has to undergo an internal quality control by the Technical Reviewer(s) to be approved.

Details of the Technical Reviewer(s) are provided within the Verification Report in Section B.2. and Appendix 2 for further references of knowledge and capability to conduct the quality checking.

After the Technical Review process, the final documentation may undergo a final quality checking process called Administrative Review, done by the Applus+ Certification's Project Manager and/or Technical Support.

For final approval, the final set of documents are prepared by the DOE's Technical Manager or its deputy and signed by the authorized signatory of the DOE.

In case any of the persons performing this final internal quality control approval process has acted as a part of the Assessment Team or Technical Review team, the approval can only be given by DOE's authorized personnel who are not part of those teams.

If the final set of documents has been satisfactorily approved, the Request for Issuance is submitted to the UNFCCC CDM EB along with the relevant documents.

SECTION G. Verification opinion

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LGAI Technological Center, S.A. (Applus+ Certification) DOE E-0032 has been contracted by PoA's CME AERA Group S.A.S to undertake the independent verification of the registered CDM PoA titled "*Man and Man Enterprise Improved Cooking Stoves CDM Programme in Ghana supported by Republic of Korea*" (PoA ID: 10430) covering CPAs titled "*Man and Man Enterprise Improved Cooking Stoves CDM Programme in Ghana supported by Republic of Korea- CPA001 (UN Ref. No. 10430-P1-0001-CP1)*" and "*Man and Man Enterprise Improved Cooking Stoves CDM Programme in Ghana supported by Republic of Korea- CPA001 (UN Ref. No. 10430-P1-0002-CP1)*". The objectives of this verification are to verify and certify emission reductions reported for the specific Component Project Activity (CPA) for the monitoring period from 14/12/2019 to 31/12/2020 (first and last day included); and to verify that the data reported are complete and transparent.

The Verification Team has, by means of a desk review /online interviews, that all physical features of the proposed PoA and CPA in the approved versions of the PoA-DD^{/19/}, version 02 dated 02/10/2019 and the CPA-DD^{/18,20,21/}, version 2.0 dated 02/10/2019 and ver. 1.8 dated 27/11/2018, respectively, are in place and that the Coordinating/Managing Entity (CME) and CPA Implementer(s) have operated the Component Project Activity as per the aforementioned references.

The review of the revised Monitoring Report^{/02/}, version 1.1 dated on 22/06/2021, the necessary supporting documentation, the publicly available information including the approved versions of the PoA-DD^{/19/}, version 02 dated on 02/10/2019 and the CPA-DD^{/18,20,21/} as well as any other external source used for cross-checking requirements and subsequent follow-up actions (Skype calls and interviews), have provided Applus+ Certification with sufficient evidences to determine the compliance with the applicable requirements and regulatory documents for the monitoring period starting on 14/12/2019 to 31/12/2020.

The final Monitoring Report^{/02/}, version 1.1 dated on 22/06/2021 complies with all the applicable requirements set out in VVS for PoA version 02.0, PS for PoA version 02.0 and PCP for PoA version 02.0 and correctly applies the selected baseline and monitoring methodology set out in the methodology AMS-II.G. Energy efficiency measures in thermal applications of non-renewable biomass (Version 08.0), as well as all the applicable requirements set out in any other applicable regulatory document.

The management of the Coordinating/Managing Entity (CME) and CPA Implementer(s) is responsible for the preparation and reporting of GHG Emission Reductions data, and the reported GHG Emission Reductions on the basis set out within the PoA and CPA monitoring plan. The development and maintenance of records and data transferring/reporting procedures in accordance with the monitoring plan, including the calculation

and determination of GHG Emission Reductions claimed by the CPA is a responsibility of the management of the Coordinating/Managing Entity (CME) and CPA Implementer(s).

It is the responsibility of Applus+ Certification to express an independent GHG Verification opinion on the GHG Emissions Reductions and on the calculation of GHG Emission Reductions claimed by the PoA CPA for this monitoring period based on the reported information in the in the Monitoring Report^{/02/}, version 1.1 dated on 22/06/2021.

Applus+ Certification's Verification process is defined as a third-party independent and objective review and ex-post determination of the monitored reductions in GHG emissions by the Component Project Activity, limited to and against the criteria stated in Article 12 of the Kyoto Protocol, the CDM Modalities and Procedures as agreed in the Marrakech Accords and the relevant decisions by the CDM Executive Board, including the approved baseline and monitoring methodology AMS-II.G. Energy efficiency measures in thermal applications of non-renewable biomass (Version 08.0)^{/27/}, the latest version of the CDM Validation and Verification Standard for Programmes of Activities (VVS for PoAs version 02.0)^{/14/}, the latest version of the CDM Project Standard for Programmes of Activities (PS for PoAs version 02.0)^{/15/} and the latest version of the CDM Project Cycle Procedure for Programmes of Activities (PCP for PoAs version 02.0)^{/16/}, as well as any other related methodological tools, guidelines and other regulatory documents adopted by the CMP or the Board.

Applus+ Certification approach was risk-based, drawing on an understanding of the risks associated with reported data and information and the controls in place to mitigate such risks. The examination includes assessment of evidences relevant to the amounts and disclosures in relation to the claimed GHG Emission Reductions for this monitoring period. The verification team has planned and performed the work to obtain the information and explanations that are considered necessary to provide sufficient evidence for the DOE to give reasonable assurance that the amount of claimed GHG Emission Reductions for this monitoring period were fairly stated.

In DOE's opinion, the Monitoring Report for the CPAs meets all relevant UNFCCC requirements for the CDM and all relevant host country criteria.

SECTION H. Certification statement

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LGAI Technological Center, S.A. (Applus+ Certification) DOE E-0032 has carried out the independent verification of the registered CDM PoA titled "*Man and Man Enterprise Improved Cooking Stoves CDM Programme in Ghana supported by Republic of Korea*" (PoA ID: 10430). The aim of the PoA is to mitigate climate change and contribute to sustainable development in Ghana. The component project activities of the Programme of Activity are designed to generate emission reductions by distribution of the fuel-efficient cook stoves in Ghana. The fuel-efficient cook stoves are replacing the baseline fossil fuels-based stoves in common use (baseline scenario).

The verification was performed to identify the compliance of the component projects with the implementation and monitoring requirements, and to verify the actual amount of achieved emission reductions, through obtaining evidence and information during the remote audit 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 2.0, dated 02/10/2019^{/19/};
- CPA-DD included in the registered PoA and its monitoring plan^{/18,20,21/}
- Approved monitoring methodology AMS-II.G "Energy efficiency measures in thermal applications of non-renewable biomass", version 08;
- Validation report ^{/19/} for the PoA and CPAs;
- Monitoring report(s) version(s) 1.1 dated 22/06/2021 respectively.

This statement covers verification period from 14/12/2019 to 31/12/2020 (including both the days).

The Monitoring Report for the CPAs, hence, is recommended by Applus+ Certification for issuance of the claimed and certified Emission Reductions for the given monitoring period within the UNFCCC CDM.

Appendix 1. Abbreviations

Abbreviations	Full texts
AQL	Acceptable Quality Limit
CDM	Clean Development Mechanism
CER	Certified Emission Reduction
CAR	Corrective Action Request
CER	Certified Emission Reduction
CL	Clarification Request
CME	Coordinating 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
GHG	Greenhouse gas(es)
GWh	Giga Watt Hour
I	Interview
IPCC	Intergovernmental Panel on Climate Change
IR	Internal resource
KNUST	Kwame Nkrumah University of Science and Technology, Kumasi, Ghana
LSC	Local Stakeholder Consultation
MWh	Mega Watt Hour
MP	Monitoring Period
MR	Monitoring Report
PoA	Programme of Activities
PoA-DD	Programme of Activities Design Document
PP	Project Participant
OSV	On Site Visit
QC/QA	Quality control /Quality assurance
RMP	Revised Monitoring Plan
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

According to the applicable sectoral scope / technical area and experience in the sectoral or national business environment, Applus+ Certification has composed an assessment team in compliance with the Contract Review and Assessment Team appointment rules in the internal Quality Management System of Applus+ Certification as well as in compliance with the applicable requirements in the Accreditation Standard.

The composition of the Assessment Team has been approved by Applus+ Certification during the Contract Review process ensuring that the required skills and capabilities are covered.

The qualification levels for Assessment Team members that are assigned by aforementioned appointment rules are as presented below:

- Lead Auditor (LA).
- Auditor (A).
- Technical Expert (TE).
- Technical Reviewer (TR).
- Any of the above mentioned roles in training (iT, e.g. AiT for auditor in training).

The Sectoral Scope / Technical Area required knowledge linked to the applied methodology(ies) is covered by the Assessment Team as shown below:

Name	Role	SS/TA Knowledge	Financial Expertise	Attendance to on-site visit
Mr. Pankaj Kumar	LA / TE	YES (3.1)	n/a	n/a
Mr. Miguel A. Cortés	TR / TE	YES (3.1)	n/a	n/a

A brief Curriculum Vitae (CV) of the Assessment Team members is provided below:

Mr. Pankaj Kumar Mr. Pankaj Kumar worked as team leader – Bihar for South Asia Climate Proofing and Growth Development(CPGD) – Climate Change Innovation Programme (CCIP) supported by DFID that seeks to mainstream climate change resilience into planning and budgeting at the national and sub-national level in India, Pakistan, Nepal, and Afghanistan. Pankaj Kumar has worked previously with IL&FS Infrastructure Development Corporation and BUIDCO(Bihar Urban Infrastructure Development Corporation), Govt. of Bihar as Environmental Specialist for WB & ADB funded projects. Prior to this, he worked with Carbon Check (UNFCCC accredited DoE), Johannesburg, RSA as Team Leader for validation, verification. He has extensive experience in the Renewable, Waste Management and Energy Demand Scopes of UNFCCC CDM and has done more than 100 Validations and Verifications of PAs and PoAs as Team Leader, Technical Expert and Technical Reviewer, mainly in Africa (including PoAs in Mozambique) and Asia regions. Pankaj is accredited Lead Auditor, Validator, Verifier and Technical Expert for Sectoral Scope/Technical Area – 1.1, 1.2, 3.1 & 13.1 by UNFCCC DoE (Designated Operational Entity), APPLUS, Spain. He is also member of task force on climate change & human health, Health Department, GoB.

He is an experienced, qualified and result oriented Environment Professional having more than 14 yrs. of relevant experience in Climate Change (Mitigation & Adaptation), Environmental Due Diligence, Disaster Risk Reduction, Validation and Verification of GHG project under CDM, Verified Carbon Standard, Gold Standard & Social Carbon Standard, Brazil. He provides technical support for environmental investigative, consultative and remedial projects involving air, water and soil, Waste management, EIA, Environmental Compliance, ISO 14001, OHSAS 18001, GHG accounting (ISO 14064) and Carbon foot printing.

Pankaj Kumar is Masters in Environment Management from Forest Research Institute (University), I.C.F.R.E, Dehradun, which is Centre of Excellence in South East Asia for Forestry education & research and PGDEL from National Law School of India University, Bangalore (India).

Mr. Miguel A. Cortés

Mr. Miguel A. Cortés holds a Bachelor's Science Degree on Civil and Environmental Engineering, being specialized on Hydric Resources.

He has worked as CDM/VCS/GS and environmental consultant for different industries of multidisciplinary sectors world widely.

Mr. Miguel Cortés counts with several years of GHG assessment experience, working and being qualified as Lead Auditor and Technical Reviewer for different DOEs world widely, as well as has been part of Gold Standard expert's committees.

Furthermore, he has performed his professional GHG assessment portfolio career worldwide and focusing in Latin America, developing assessments for projects in Argentina, Mexico, Panama, Colombia and Chile, among others

Appendix 3. Documents reviewed or referenced

No.	Author	Title	References to the document	Provider
1	AERA Group	Webhosted MR	Ver. 1.0 dated 07/12/2020	CME
2	AERA Group	Final Monitoring report	Ver. 1.1 dated 22/06/2021	CME
3	AERA Group	ER sheet and inspection records	Ver 01 dated 07/12/2020	CME
4	AERA Group	Final ER sheet	Ver. 02, dated 22/06/2021	CME
5	AERA Group	Monitoring and Sales Database	NA	CME
6	AERA Group	Efficiency Test Results: 1. Water Boiling Tests	Jan. 2021	CME
7	AERA Group	Training Certificates for monitoring personnel	NA	CME
8	Kwame Nkrumah University of Science and Technology, Kumasi	Equipment Calibration confirmation	22/07/2020	CME
9	Man and Man Enterprises	Sample Stove sales agreement	NA	CME
10	Kwame Nkrumah University of Science and Technology, Kumasi	QA/QC Procedures: Capacity of the laboratory and the credentials of the personnel involved in WBT		CME
11	AERA Group	Request from the CME for exemption of the on-site visit along with the CER commitment document		CME
12	Man and Man Enterprises	Replacement records of after sales service stoves	2019-20	CME
13	AERA Group	Local Stakeholder Consultation: 1. Invitation Letters 2. Attendance Sheet	NA	CME

		3. Minutes of Meeting 4. LSC Presentation 5. LSC Evaluation Forms 6. Photographs 7. Newspaper LSC Invitation of 24/10/2018		
14	UNFCCC	Validation and Verification Standard for PoAs, version 02.0	http://cdm.unfccc.int/	Others
15	UNFCCC	Project Standard for PoAs, version 02.0	http://cdm.unfccc.int/	Others
16	UNFCCC	Project Cycle Procedure for PoAs, version 02.0	http://cdm.unfccc.int/	Others
17	UNFCCC	Registered PoA-DD (version 1.7 dated 27/07/2018) and corresponding validation report;	http://cdm.unfccc.int/	Others
18	UNFCCC	CPA-DD for 10430-P1-0001-CP1: (version 1.8 dated 27/11/2018) and corresponding validation report;	http://cdm.unfccc.int/	Others
19	UNFCCC	Revised Approved PoA-DD (version 2.0 dated 02/10/2019) and corresponding validation report;	http://cdm.unfccc.int/	Others
20	UNFCCC	CPA-DD for 10430-P1-0001-CP1: (version 2.0 dated 02/10/2019) and corresponding validation report;	http://cdm.unfccc.int/	Others
21	UNFCCC	CPA-DD for 10430-P1-0002-CP1: (version 2.0 dated 02/10/2019) and corresponding validation report;	http://cdm.unfccc.int/	Others
22	UNFCCC	Guidelines: Sampling and surveys for CDM project activities and programmes of activities, Version 04.0 (Latest)	http://cdm.unfccc.int/	Others
23	UNFCCC	Standard: Standard for sampling and surveys for CDM project activities and Programme of Activities, version 07.0	http://cdm.unfccc.int/	Others
24	UNFCCC	Guideline: Application of materiality in verifications” Version 02.0	http://cdm.unfccc.int/	Others
25	UNFCCC	Methodological Tool: Calculation of the fraction of non-renewable biomass, version 03.0	http://cdm.unfccc.int/	Others
26	PCIA/ Global Alliance for Clean Cookstoves	The Water Boiling Test, version 4.2.3	https://cleancookstoves.org	Others
27	UNFCCC	Applied baseline and monitoring	http://cdm.unfccc.int/	Others

		methodology, AMS-II.G, Ver. 08		
28	Web sites	www.ipcc.ch www.cdm.unfccc.int		
29	AERA Group	Monitoring survey questionnaire		Others
30	AERA Group	Sample survey conducted of households as a part of remote audit		Others

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

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

FAR ID	01	Section no.		Date:	14/09/2020
Description of FAR					
<i>Few discrepancies in the usernames were found during the DOE interviews with the household. CME conducted follow up with the households and to report the correct household names and the reason for difference. In order to avoid the situation during the subsequent periodic verifications, CME has proposed to include a question in the monitoring survey questionnaire to check the details of the person who bought the stove initially and to check if the interview respondent is same/ different from the household records available. FAR 01 has been raised in this regard.</i>					
Project participant response					Date: 04/05/2021
<i>A question in the monitoring survey questionnaire has been added in order to get the details of the person who bought the stove initially. This enables to check if the interview respondent is same/ different from the household records available.</i>					
Documentation provided by project participant					
<i>Revised monitoring survey questionnaire</i>					
DOE assessment					Date: 20/05/2021
<i>DOE confirms that the applicable changes in the monitoring survey questionnaire inserted for this verification to ensure that interview respondent is same as household records. FAR closed</i>					

Table 2. CL from this verification

CL ID	01	Section no.		Date:	28/04/2021
Description of CL					
<i>Supporting evidence of considering the value of $\eta_{new,i,j}$ (Efficiency of the device of each type) has not been provided. Clarification requested</i>					
Project participant response					Date: 04/05/2021
<i>Water boiling test reports are now provided as received from the laboratory</i>					
Documentation provided by project participant					
<i>Water boiling test report</i>					
DOE assessment					Date: 20/05/2021
<i>DOE has assessed the water boiling test report and found it satisfactory and in line with the data mentioned in MR. CL is closed.</i>					

Table 3. CAR from this verification

CAR ID	01	Section no.		Date:	28/04/2021
Description of CAR					
<i>The value of "Amount of GHG emission reductions or net anthropogenic GHG removals achieved by all CPAs covered in this monitoring report in this monitoring period" mentioned in the title page of MR is not consistent with the value mentioned in ER calculation sheet and section F.4 and F.5 of MR. Corrective action requested</i>					
Project participant response					Date: 04/05/2021

<i>Value of GHG emission reductions has been corrected based on actual WBT outcome. MR has been updated to account for this monitoring period stoves' efficiency test results, instead of earlier provisional expectations.</i>	
Documentation provided by project participant	
<i>Revised MR</i> <i>Revised ER sheet</i>	
DOE assessment	Date: 20/05/2021
DOE has assessed the revised MR and ER sheet and found that "Amount of GHG emission reductions or net anthropogenic GHG removals achieved by all CPAs covered in this monitoring report in this monitoring period" is consistent in section E=F.4, F.5 and title page of MR. CAR is closed.	

CAR ID	02	Section no.	A.1.2	Date: 28/04/2021
Description of CAR				
<i>The serial number of CPAs mentioned in section A.1.2 of MR and the font used for that are not consistent throughout the monitoring report. Corrective action requested</i>				
Project participant response				Date: 04/05/2021
<i>CPA numbering and fonts have been corrected</i>				
Documentation provided by project participant				
<i>Revised MR</i>				
DOE assessment				Date: 20/05/2021
DOE has assessed the revised MR and found that CPA serial number and Font used for that are consistent throughout the MR. CAR is closed.				

CAR ID	03	Section no.	C.2	Date: 28/04/2021
Description of CAR				
<i>Description of location of the CPAs as provided in section C.2 is not in line with CDM MR for PoA. Corrective action requested</i>				
Project participant response				Date: 04/05/2021
<i>Description of CPAs locations has been revised to make it consistent with previous Monitoring reports, while the PoA-DD boundaries was the whole republic of Ghana</i>				
Documentation provided by project participant				
<i>Revised MR</i>				
DOE assessment				Date: 20/05/2021
DOE has assessed the revised MR and has found that description of CPAs locations in line with CDM MR for PoA. CAR is closed.				

CAR ID	04	Section no.	F.4	Date: 28/04/2021
Description of CAR				
<i>ER calculation sheet has been provided but is reserved as Baseline Emissions and Project Emissions are not clearly shown in ER calculation sheet. Corrective action requested.</i>				
Project participant response				Date: 04/05/2021
<i>ER calculation details including BE and PE emissions are shown in the CER calculation tab</i>				
Documentation provided by project participant				
<i>Revised ER</i>				
DOE assessment				Date: 20/05/2021
DOE has assessed the revised ER sheet. But ER sheet is still not clear on Baseline emissions and Project emissions of each CPA for this monitoring period. CME is requested to demonstrate Baseline and Project emissions clearly in ER calculation spread sheet. CAR is open.				

CAR ID	05	Section no.	E.3	Date: 28/04/2021
Description of CAR				
<i>Sampling required for verification of the PoA has not been explained explicitly in MR. PP is requested to provide the sampling description with more details.</i>				
Project participant response				Date: 04/05/2021
<i>Sampling has been explained in section E.3</i>				
Documentation provided by project participant				

Revised MR	
DOE assessment	Date: 20/05/2021
DOE has assessed the revised MR and found that sampling plan clearly explained in MR. CAR is closed	

Table 4. FAR from this verification:

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

Appendix 5. Data and parameters fixed ex-ante

Means of verification	B_{old,p} Annual quantity of woody biomass that would have been used per person in the household in the absence of the project activity to generate useful thermal energy equivalent to that provided by the project devices.
Default values used:	180 kg/capita/year (CPA001 and CPA002)
Purpose of data	Baseline emission calculation
Source and Verification of the source	UN Food & Agriculture Organization (FAO 2017): The Charcoal Transition. Greening the charcoal value chain to mitigate climate change and improve local livelihoods. p. 139 (http://www.fao.org/3/a-i6935e.pdf) The value is cross verified from the revised approved CPA-DDs ^{/18,20,21/}

Means of verification	N_{p,HH} Average number of persons served per household prior to project implementation.
Default values used:	4 (CPA001 and CPA002)
Purpose of data	Baseline emission calculation
Source and Verification of the source	Table 2.1 of Ghana Statistical Service 2014: Ghana Living Standards Survey Round 6 (GLSS 6). Main report. The value cross checked with the below web links and also verified from the revised approved CPA-DDs ^{/18,20,21/} (https://statsghana.gov.gh/gssmain/fileUpload/Living%20conditions/GLSS6_Main%20Report.pdf)

Means of verification	B_{old,HH} Annual quantity of woody biomass that would have been used in the household in the absence of the project activity to generate useful thermal energy equivalent to that provided by the project devices.
Default values used:	4.32 (CPA001 and CPA002)
Purpose of data	Baseline emission calculation
Source and Verification of the source	Determined ex ante at CPA-level Cross verified from the revised CPA-DDs ^{/18,20,21/} approved by UNFCCC.

Means of verification	B_{old,i,j} Annual quantity of woody biomass that would have been used in the absence of the project activity to generate useful thermal energy equivalent to that provided by the project device type <i>i</i> and batch <i>j</i> .
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Default values used:	3.83 (CPA001) 3.91 (CPA002)
Purpose of data	Baseline emission calculation
Source and Verification of the source	Determined ex ante at CPA-level Cross verified from the revised CPA-DDs ^{/18,20,21/} approved by UNFCCC.

Means of verification	$\eta_{old,i,j}$ Efficiency of the device being replaced
Default values used:	18% (Both CPAs)
Purpose of data	Baseline emission calculation
Source and Verification of the source	The average value for baseline efficiency is based on Ghana case study – Growing Inclusive Markets (UNDP, 2010) : https://bit.ly/2R8pYAs Cross verified from the revised CPA-DDs ^{/18,20,21/} approved by UNFCCC.

Means of verification	$EF_{projected_fossilfuel}$ Emission factor for the fossil fuels projected to be used for substitution of non-renewable woody biomass by similar consumers.
Default values used:	81.6
Purpose of data	Baseline emission calculation
Source and Verification of the source	2006 IPCC Guidelines for National Greenhouse Gas Inventories Cross verified from the revised CPA-DDs ^{/18,20,21/} approved by UNFCCC and in line with approved methodology ^{/27/} .

Means of verification	$m_{wood}/m_{charcoal}$ Conversion factor wood/charcoal.
Default values used:	6
Purpose of data	Baseline emission calculation
Source and Verification of the source	AMS II.G, para. 23 Cross verified from the revised CPA-DDs ^{/18,20,21/} approved by UNFCCC.

Means of verification	$Leakage_{ad}$ Net to gross adjustment factor to account for leakages
Default values used:	0.95
Purpose of data	Baseline emission calculation
Source and Verification of the source	AMS II.G. Cross verified from the revised CPA-DDs ^{/18,20,21/} approved by UNFCCC.

Means of verification	$f_{NRB,y}$ Fraction of woody biomass saved by the project activity in year y that can be established as non-renewable biomass.
Default values used:	0.9884 (both CPAs)
Purpose of data	Baseline emission calculation
Source and Verification of the source	FAO and IPCC data and other sources of information (as per Information note: Default values of fraction of non-renewable biomass for least developed countries and small island developing states, version 01.0 (EB 67, Annex 22)). Cross verified from the revised CPA-DDs ^{/18,20,21/} approved by UNFCCC.

Appendix 6. Data and parameters monitored

Monitoring Parameter Requirement	Assessment/ Observation by the DOE
Data / Parameter: (as in monitoring plan of CPA-DD):	Ny,i,j
Description	No. of project devices of type I and batch j operating during year y
Measured/calculated	Calculated
Value (s) of monitored parameter	109,241 (CPA001) 104,846 (CPA002)
Measuring frequency/Time Interval:	annually.
Reporting frequency:	Annual (Once for this monitoring period)
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
Details of monitoring equipment:	No monitoring equipment used to determine the monitoring parameter. The parameter is determined based on the electronic database of the stoves distributed and the monitoring surveys.
Is accuracy of the monitoring equipment as stated in the CPA-DD? If the CPA-DD does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practise?	Not Applicable since no equipment is used to determine the parameter.
Calibration frequency /interval: Is it monitoring methodology /CDM EB guidance / local or national standards / manufacturers specification	No equipment used hence the calibration requirement not applicable.
Is the calibration interval in line with the monitoring plan of the CPA-DD? If the CPA-DD does not specify the frequency of calibration, does the selected frequency represent good monitoring practise?	No equipment used hence the calibration requirement not applicable.
Company performing the calibration (internal or external calibration):	No equipment used hence the calibration requirement not applicable.
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	No equipment used hence the calibration requirement not applicable.
Is (are) calibration(s) valid for the whole reporting period?	No equipment used hence the calibration requirement not applicable.
If applicable, has the reported data been cross-checked with other available data?	Yes, the value of parameter has been cross checked with the monitored database /05/ and monitoring survey questionnaires/05/ were checked during the remote interviews.
How were the values in the monitoring report verified?	The values mentioned in the MR have been cross checked with the monitored database /05/ and monitoring survey questionnaires/29/. The data was then verified against the sample households checked during the remote audit/30/The monitored value of the number of project devices of type i and batch j operating during year y are less than the ex-ante estimates as the project has been in implementation for less than a year and the

	ex-ante estimate was based on the complete crediting period of the CPAs/18,20,21/. The proportion of operational stoves ($p_{op_stoves,y}$) observed during the monitoring is 99.01 % for CPA 001 and 99.06% for CPA 002, which is higher than the ex-ante estimates of 90.38% for CPA 001 and same for CPA 002. The higher value of the operational stoves for CPA 001 is justified as the stoves have been in operation for less than a year and thus mostly found operational. The values were cross-checked through the remote interviews with the households during the remote audit.
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, the data management ensures correct transfer of data and reporting of emission reductions and all necessary QA/QC processes are in place.</p> <p>The appropriate QA/QC procedures have been followed for the monitoring parameter. The monitoring surveys have been conducted by the trained personnel of the CPA implementer, Man and Man Enterprises under the supervision of the CME.</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, full data available for the monitoring period

Monitoring Parameter Requirement	Assessment/ Observation by the DOE
Data / Parameter: (as in monitoring plan of CPA-DD):	NA
Description	Adjustment to account for any continued use of pre-project devices during year y
Measured/calculated	Measured
Value (s) of monitored parameter	0.7980 for CPA001 0.8758 for CPA002
Measuring frequency/Time Interval:	Annual monitoring
Reporting frequency:	Annual (Once for this monitoring period)
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
Details of monitoring equipment:	No monitoring equipment used to determine the monitoring parameter. The parameter is determined based on the electronic database of the stoves distributed and the monitoring surveys.
Is accuracy of the monitoring equipment as stated in the CPA-DD? If the CPA-DD does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practise?	Not Applicable since no equipment is used to determine the parameter.
Calibration frequency /interval: Is it monitoring methodology /CDM EB guidance / local or national standards /	No equipment used hence the calibration requirement not applicable.

manufacturers specification	
Is the calibration interval in line with the monitoring plan of the CPA-DD? If the CPA-DD does not specify the frequency of calibration, does the selected frequency represent good monitoring practise?	No equipment used hence the calibration requirement not applicable.
Company performing the calibration (internal or external calibration):	No equipment used hence the calibration requirement not applicable.
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	No equipment used hence the calibration requirement not applicable.
Is (are) calibration(s) valid for the whole reporting period?	No equipment used hence the calibration requirement not applicable.
If applicable, has the reported data been cross-checked with other available data?	Yes, the value of parameter has been cross checked with the ER sheet and inspection records /03 and monitoring survey questionnaires/05/ were checked during the remote interviews.
How were the values in the monitoring report verified?	<p>The values mentioned in the MR have been cross checked with the monitored database /04/ and monitoring survey questionnaires/05/. The data was then verified against the sample households checked during the remote audit.</p> <p>The monitored value for the parameter Adjustment to account for any continued use of pre-project devices during year y is lower than the ex-ante estimates for CPA 001 and higher for CPA 002. Based on the interviews, CME has justified that the decrease in value is due to the higher number of baseline/ alternative stoves in usage compared to the ex-ante estimates for CPA 001 and some of the users in CPA 002 continue to use baseline stoves in CPA 002, thus higher. However, some difference from the estimated values is expected.</p>
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, the data management ensures correct transfer of data and reporting of emission reductions and all necessary QA/QC processes are in place.</p> <p>The appropriate QA/QC procedures have been followed for the monitoring parameter. The monitoring surveys have been conducted by the trained personnel of the CPA implementer, Man and Man Enterprises under the supervision of the CME.</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, full data available for the monitoring period

Monitoring Parameter Requirement	Assessment/ Observation by the DOE
Data / Parameter: (as in monitoring plan of CPA-DD):	$\eta_{new,i,j}$
Description	Efficiency of the device of each type i and batch j

	implemented as part of the project activity
Measured/calculated	Measured
Value (s) of monitored parameter	32,29% for CPA001 31,97% for CPA002
Measuring frequency/Time Interval:	Annual monitoring
Reporting frequency:	Annual (Once for this monitoring period)
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
Details of monitoring equipment:	The WBTs have been conducted by a third party, KNUST Technology & Consultancy Center, a partner of the Global Alliance for Clean Cookstoves. According to the letter/08/ provided by the third party, KNUST test center was established by the Aprovecho Research Center with state-of-the art automated equipment funded by UNDP, no further calibration of electronic scales or thermocouples is applicable. Verification team confirms that WBT conducted in line with applied methodology/27/ and 3 rd party who conducted the WBT are credible and reports are reliable and acceptable.
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 as the WBTs are conducted by a third party.
Calibration frequency /interval: Is it monitoring methodology /CDM EB guidance / local or national standards / manufacturers specification	NA as the WBTs are conducted by a third party.
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 as the WBTs are conducted by a third party.
Company performing the calibration (internal or external calibration):	KNUST Technology & Consultancy Center (External calibration)
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	NA as the WBTs are conducted by a third party.
Is (are) calibration(s) valid for the whole reporting period?	Yes, in accordance with the letter provided by the third party/08/.
If applicable, has the reported data been cross-checked with other available data?	The reported data has been cross-checked with the WBT test records/06/, ER sheet /04/ and MR /02/. WBT test conducted by KNUST lab which is partner of Global alliance for clean cookstoves.
How were the values in the monitoring report verified?	The value for the reported data was verified against the WBT test records /06/. WBT test results also cross checked for Ghana by referring http://catalog.cleancookstoves.org/test-results and results are found within the acceptable range. The Efficiency of the device of each type i and batch j implemented as part of the project activity monitored ex-post for the current monitoring period is marginally higher

	<p>than the estimated ex-ante value in the CPA-DDs/18,20,21/.</p> <p>The value of the efficiency is justified as it is based on the results available from the actual results/06/ conducted on the project stoves and the competency of the laboratory has been confirmed through the provided document/10/ on the capacity of the laboratory and the team conducting the tests.</p>
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, the data management ensures correct transfer of data and reporting of emission reductions and all necessary QA/QC processes are in place.</p> <p>The appropriate QA/QC procedures have been followed for the monitoring parameter. The WBTs were conducted in a state-of-the-art laboratory set up by Aprovecho Research Center/10/. Based on the capacity of the laboratory and the credentials of the personnel involved in WBT/10/, it is confirmed that the appropriate QA/QC procedures have been followed by the CME for the WBTs.</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, The data has been monitored in accordance with the registered monitoring plan.

Monitoring Parameter Requirement	Assessment/ Observation by the DOE
Data / Parameter: (as in monitoring plan of CPA-DD):	NCV _{biomass}
Description	Net calorific value of the non-renewable woody biomass used in project devices.
Measured/calculated/Default	Default
Value (s) of monitored parameter	0.015 TJ/Tonne
Measuring frequency/Time Interval:	Yearly
Reporting frequency:	Yearly (Once for this monitoring period)
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
Details of monitoring equipment:	No monitoring equipment used to determine the monitoring parameter. The parameter is determined based on the methodology, AMS-II.G, version 08/27/ and 2006 IPCC Guidelines for National Greenhouse Gas Inventories/28/.
Is accuracy of the monitoring equipment as stated in the CPA-DD? If the CPA-DD does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practise?	Not Applicable since no equipment is used to determine the parameter.
Calibration frequency /interval: Is it monitoring methodology /CDM EB	No equipment used hence the calibration requirement not applicable.

guidance / local or national standards / manufacturers specification	
Is the calibration interval in line with the monitoring plan of the CPA-DD? If the CPA-DD does not specify the frequency of calibration, does the selected frequency represent good monitoring practise?	No equipment used hence the calibration requirement not applicable.
Company performing the calibration (internal or external calibration):	No equipment used hence the calibration requirement not applicable.
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	No equipment used hence the calibration requirement not applicable.
Is (are) calibration(s) valid for the whole reporting period?	No equipment used hence the calibration requirement not applicable.
If applicable, has the reported data been cross-checked with other available data?	No equipment used hence the calibration requirement not applicable.
How were the values in the monitoring report verified?	The values mentioned in the MR have been cross checked with methodology, AMS-II.G, version 08/27/ and 2006 IPCC Guidelines for National Greenhouse Gas Inventories/28/.
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 appropriate QA/QC procedures have been followed for the monitoring parameter.
In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	NA, Full data is available for the monitoring period.

Monitoring Parameter Requirement	Assessment/ Observation by the DOE
Data / Parameter: (as in monitoring plan of CPA-DD):	Date of commissioning of batch j
Measuring frequency/Time Interval:	Fixed and recorded at the time of commissioning/ distribution of the last project device in the batch.
Reporting frequency:	Fixed and recorded at the time of commissioning/ distribution of the last project device in the batch.
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
Details of monitoring equipment:	No monitoring equipment used to determine the monitoring parameter. The parameter is determined based on the values recorded in the monitoring database/04/.
Is accuracy of the monitoring equipment as stated in the CPA-DD? If the CPA-DD does not specify the	Not Applicable since no equipment is used to determine the parameter.

accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practise?	
Calibration frequency /interval: Is it monitoring methodology /CDM EB guidance / local or national standards / manufacturers specification	No equipment used hence the calibration requirement not applicable.
Is the calibration interval in line with the monitoring plan of the CPA-DD? If the CPA-DD does not specify the frequency of calibration, does the selected frequency represent good monitoring practise?	No equipment used hence the calibration requirement not applicable.
Company performing the calibration (internal or external calibration):	No equipment used hence the calibration requirement not applicable.
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	No equipment used hence the calibration requirement not applicable.
Is (are) calibration(s) valid for the whole reporting period?	No equipment used hence the calibration requirement not applicable.
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 and sales database /05/.
How were the values in the monitoring report verified?	Yes, the value of parameter has been cross checked with the ER sheet /04/.
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 appropriate QA/QC procedures have been followed for the monitoring parameter.
In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	NA, Full data is available for the monitoring period.

Monitoring Parameter Requirement	Assessment/ Observation by the DOE
Data / Parameter: (as in monitoring plan of CPA-DD):	Date of commissioning of batch i
Measuring frequency/Time Interval:	Recorded at the time of commissioning/distribution of project devices
Reporting frequency:	Recorded at the time of commissioning/distribution of project devices
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
Details of monitoring equipment:	No monitoring equipment used to determine the monitoring parameter. The parameter is determined based on the values recorded in the monitoring database/05/.

Is accuracy of the monitoring equipment as stated in the CPA-DD? If the CPA-DD does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practise?	Not Applicable since no equipment is used to determine the parameter.
Calibration frequency /interval: Is it monitoring methodology /CDM EB guidance / local or national standards / manufacturers specification	No equipment used hence the calibration requirement not applicable.
Is the calibration interval in line with the monitoring plan of the CPA-DD? If the CPA-DD does not specify the frequency of calibration, does the selected frequency represent good monitoring practise?	No equipment used hence the calibration requirement not applicable.
Company performing the calibration (internal or external calibration):	No equipment used hence the calibration requirement not applicable.
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	No equipment used hence the calibration requirement not applicable.
Is (are) calibration(s) valid for the whole reporting period?	No equipment used hence the calibration requirement not applicable.
If applicable, has the reported data been cross-checked with other available data?	Yes, the value of parameter has been cross checked with the ER sheet /04/.
How were the values in the monitoring report verified?	Yes, the value of parameter has been cross checked with the ER sheet /04/.
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 appropriate QA/QC procedures have been followed for the monitoring parameter.
In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	NA, Full data is available for the monitoring period.

Monitoring Parameter Requirement	Assessment/ Observation by the DOE	
Data / Parameter: (as in monitoring plan of CPA-DD):	N	
Description	Number of project devices distributed	
Measured/calculated/Default	Calculated	
Value (s) of monitored parameter	CPA001	166,421
	CPA002	182,188
	TOTAL	348,609
Measuring frequency/Time Interval:	Recorded at the time of commissioning/distribution of project devices	
Reporting frequency:	Calculated annually	
Is measuring and reporting frequency	Yes	

in accordance with the monitoring plan and monitoring methodology? (Yes / No)	
Details of monitoring equipment:	No monitoring equipment used to determine the monitoring parameter. The parameter is determined based on the values recorded in the monitoring database/04/ which is an electronic database used for registering all ICSs sold. Every time an ICS is sold a sale agreement is filled and an electronic database is filled. Based on the information collected into this electronic database, the number of ICSs distributed is determined.
Is accuracy of the monitoring equipment as stated in the CPA-DD? If the CPA-DD does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practise?	Not Applicable since no equipment is used to determine the parameter.
Calibration frequency /interval: Is it monitoring methodology /CDM EB guidance / local or national standards / manufacturers specification	No equipment used hence the calibration requirement not applicable.
Is the calibration interval in line with the monitoring plan of the CPA-DD? If the CPA-DD does not specify the frequency of calibration, does the selected frequency represent good monitoring practise?	No equipment used hence the calibration requirement not applicable.
Company performing the calibration (internal or external calibration):	No equipment used hence the calibration requirement not applicable.
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	No equipment used hence the calibration requirement not applicable.
Is (are) calibration(s) valid for the whole reporting period?	No equipment used hence the calibration requirement not applicable.
If applicable, has the reported data been cross-checked with other available data?	Yes, the value of parameter has been cross checked with the ER sheet /04/.
How were the values in the monitoring report verified?	Yes, the value of parameter has been cross checked with the ER sheet /04/.
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 as confirmed with ER sheet inspection record/04/ and stoves sales monitoring database/05/. The appropriate QA/QC procedures have been followed for the monitoring parameter.
In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	NA, Full data is available for the monitoring period.

Monitoring Parameter Requirement	Assessment/ Observation by the DOE
Data / Parameter: (as in monitoring plan of CPA-DD):	Date of commissioning of batch i
Measuring frequency/Time Interval:	Recorded at the time of commissioning/distribution of project devices
Reporting frequency:	Recorded at the time of commissioning/distribution of project devices
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
Details of monitoring equipment:	No monitoring equipment used to determine the monitoring parameter. The parameter is determined based on the values recorded in the monitoring database/04/.
Is accuracy of the monitoring equipment as stated in the CPA-DD? If the CPA-DD does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practise?	Not Applicable since no equipment is used to determine the parameter.
Calibration frequency /interval: Is it monitoring methodology /CDM EB guidance / local or national standards / manufacturers specification	No equipment used hence the calibration requirement not applicable.
Is the calibration interval in line with the monitoring plan of the CPA-DD? If the CPA-DD does not specify the frequency of calibration, does the selected frequency represent good monitoring practise?	No equipment used hence the calibration requirement not applicable.
Company performing the calibration (internal or external calibration):	No equipment used hence the calibration requirement not applicable.
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	No equipment used hence the calibration requirement not applicable.
Is (are) calibration(s) valid for the whole reporting period?	No equipment used hence the calibration requirement not applicable.
If applicable, has the reported data been cross-checked with other available data?	Yes, the value of parameter has been cross checked with the ER sheet /04/.
How were the values in the monitoring report verified?	Yes, the value of parameter has been cross checked with the ER sheet /04/.
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 appropriate QA/QC procedures have been followed for the monitoring parameter.
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	NA, Full data is available for the monitoring period.

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):	N _{d,HH}
Description	Number of project devices distributed per household
Measured/calculated/Default	Measured
Value (s) of monitored parameter	1.13 (CPA001) 1.10 (CPA002)
Measuring frequency/Time Interval:	Recorded at the time of commissioning/distribution of project devices
Reporting frequency:	Recorded at the time of commissioning/distribution of project devices
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
Details of monitoring equipment:	No monitoring equipment used to determine the monitoring parameter. The parameter is determined based on the electronic database and internal records. Only one cooking stove per household is registered in the electronic database. If a household purchases more than one cooking stoves, monitoring surveys of sampled kitchens' stoves in use will account for any additional project device and be reflected in adjustment factor N _{d,HH} . DoE confirmed that procedure used for measurement of no. of project devices distributed per household is in compliance with applied methodology/27/
Is accuracy of the monitoring equipment as stated in the CPA-DD? If the CPA-DD does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practise?	Not Applicable since no equipment is used to determine the parameter.
Calibration frequency /interval: Is it monitoring methodology /CDM EB guidance / local or national standards / manufacturers specification	No equipment used hence the calibration requirement not applicable.
Is the calibration interval in line with the monitoring plan of the CPA-DD? If the CPA-DD does not specify the frequency of calibration, does the selected frequency represent good monitoring practise?	No equipment used hence the calibration requirement not applicable.
Company performing the calibration (internal or external calibration):	No equipment used hence the calibration requirement not applicable.
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	No equipment used hence the calibration requirement not applicable.
Is (are) calibration(s) valid for the whole reporting period?	No equipment used hence the calibration requirement not applicable.
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 and sales database /05/.

How were the values in the monitoring report verified?	Yes, the value of parameter has been cross checked with the monitoring and sales database /05/.
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, the data management ensures correct transfer of data and reporting of emission reductions and all necessary QA/QC processes are in place.</p> <p>The appropriate QA/QC procedures have been followed for the monitoring parameter.</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, Full data is available for the monitoring period.

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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		