




**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)	Improved cook stoves and sustainable charcoal initiative UNFCCC PoA reference number: 10516		
Version number(s) of the PoA-DD(s) to which this report applies	Version 6.0		
Version number of the verification and certification report	043		
Completion date of the verification and certification report	245/058/2021		
Monitoring period number and duration of this monitoring period	Second Monitoring Period 01/09/2020 - 31/12/2020 (including both the days)		
Number and version number of the monitoring report to which this report applies	Monitoring report number 1, Version 34, dated 204/058/2021		
Coordinating/managing entity (CME)	Nature Club of Rajasthan		
Host Parties	Host Parties of the PoA	Is this a host Party to a CPA covered in this report? (yes/no)	
	India	Yes	
Applied methodologies and standardized baselines	AMS-II.G., version 10, "Energy efficiency measures in thermal applications of non-renewable biomass" AMS-III.BG., version 03, "Emission reduction through sustainable charcoal production and consumption" AMS-I.E: "Switch from non-renewable biomass for thermal applications by the user", version 09		
Mandatory sectoral scopes	3: Energy demand 5: Chemical industries 1 : Energy industries (renewable - / non-renewable sources)		
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	101,758 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
	--	93,378 tCO ₂ e	--

Name and UNFCCC reference number of the DOE	E-0052: Carbon Check (India) Private Ltd.
Name, position and signature of the approver of the verification and certification report	Amit Anand, CEO  _____

SECTION A. Executive summary

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Introduction:

The Project Participant (atmosfair gGmbH) has appointed the DOE, Carbon Check (India) Private Ltd. (CC IPL) to perform an independent verification of the CDM Programme of Activities "Improved cook stoves and sustainable charcoal initiative" in India (hereafter referred to as "Programme of Activities or PoA") for the CPA titled "Improved cook stoves and sustainable charcoal initiative, CPA 1" in West Bengal, India which is registered under this PoA (UNFCCC Ref no PoA 10516).

The PoA involves replacement of less efficient cooking stoves using woody biomass with improved cooking stoves (ICS) which are more efficient particularly micro wood gasifier stove (TLUD). The CPA is designed to generate emission reductions by distribution of energy efficient or improved stoves for household cooking purposes in India, the same micro wood gasifier stoves also produce charcoal. The ICS (TLUD gasifier cook stove) distributed under the CPA of the PoA are more efficient than the traditional cook stove. Moreover, the consumption of conventional charcoal, by traditional charcoal users, reduces by providing them charcoal generated in these ICSs. By replacing inefficient non-renewable biomass based traditional cookstoves, the PoA will save on consumption of woody biomass. Charcoal is the by-product in the ICS, this charcoal generated from the project cookstoves will be sold to the charcoal users.

As stated in the MR /2/ and verified by document review and during the remote interviews, Nature Club of Rajasthan is the CME and atmosfair gGmbH is the project participant and has sponsored the distribution of the ICS. Sapient Infotech is the manufacturer and distributor of the project stoves along with monitoring.

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

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

Objective:

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

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

The objective of this verification was to verify and certify emission reductions reported for the "Improved cook stoves and sustainable charcoal initiative" in the host country India for the period 01/09/2020 - 31/12/2020 (inclusive of both the dates).

The purpose of verification is to review the monitoring results and verify that the monitoring was implemented according to the monitoring methodologies and the monitoring plan in the PoA-DD

/B04/ and the revised CPA-DD /15/ and used to confirm that the reductions in anthropogenic emissions by sources, are sufficient, definitive and presented in a concise and transparent manner. CCIPL's objective is to perform a thorough, independent assessment of the implementation of the registered PoA-DD and approved revised CPA-DD /B04/.

In particular, the monitoring plan, monitoring report and the project's compliance with relevant UNFCCC and host Party criteria are verified in order to confirm that the component project/s has/have been implemented in accordance with the previously registered/included component project design and conservative assumptions, as documented. It is also confirmed if the monitoring plan is in compliance with the registered/included CPA-DD and the approved monitoring methodologies, AMS-II.G (version 10) and AMS-III.BG (version 03.0) /B02/.

Scope:

The scope of the verification is:

- To verify the project implementation and operation with respect to the revised and approved CPA-DD /B04/
- To verify the implemented monitoring plan with the CPA-DD and applied baseline and monitoring methodology.
- To verify that the actual monitoring systems and procedures are in compliance with the monitoring systems and procedures described in the monitoring plan.
- To evaluate the GHG emission reduction data and express a conclusion with a reasonable level of assurance about whether the reported GHG emission reduction data is free from material misstatement.
- To verify that reported GHG emission data is sufficiently supported by evidence.

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

The verification comprises a review of the monitoring report covering the monitoring period from 01/09/2020- 31/12/2020 and based on the revised CPA-DD including the monitoring plan, emission reduction calculation spreadsheet, monitoring methodology and all related evidence provided by project participant.

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

The verification team assigned by the DOE concludes that the PoA-DD (Version 6.0, dated 09/03/2020) /B04/, CPA: 10516-P1-0001-CP1 as described in the revised CPA-DD and the Monitoring report, Version 34, dated 204/058/2021 /2/, meet all relevant requirements of the UNFCCC for CDM project activities including article 12 of the Kyoto Protocol and paragraph 62 of CDM M & P, the modalities and procedures for CDM (Marrakesh Accords) and the subsequent decisions by the COP/MOP and CDM Executive Board. The verification has been conducted in-line with the CDM VVS for PoAs requirements Version 02.0 /B01-1/.

The component project activity was correctly implemented according to selected monitoring methodology, monitoring plan and the CPA-DD. The monitoring system was installed, maintained in a proper manner, while collected monitoring data allowed for the verification of the amount of achieved GHG emission reductions. Through the review and remote interviews, the verification team confirms that the PoA has resulted in the 93,378 tCO₂e emission reductions during the second monitoring period.

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

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

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)	Involvement in			
						Desk/document review	On-site inspection	Interview(s)	Verification findings
1.	Team Leader/Technical Expert/Local Expert	IR	Agarwalla	Sanjay Kumar	CC IPL	X	-	X	X
2.	Trainee Assessor	IR	Gedam	Pallavi Ganesh	CC IPL	X	-	X	X

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

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

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

No.	Risk that could lead to material errors, omissions or misstatements	Assessment of the risk		Response to the risk in the verification plan and/or sampling plan
		Risk level	Justification	
1.	Human Error: Recording and reporting of the information in the ER spreadsheet.	Medium	<i>All the input data in the ER spreadsheet including sales database, charcoal collection and sales records, 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-DD /B04/.</i>	<i>The risk was mitigated by the training of the personnel involved in the data capture, calculation and those involved in the supervision of the stove sales database, charcoal collection and sales and WBT and by following the monitoring responsibilities. The training records were reviewed which were also confirmed during the remote interviews. Verification team, based on the above, confirms that the risk is appropriately mitigated.</i>
2.	Information System: Use of spreadsheets without adequate controls related to data changes/updates, version tracking, traceability, security	Medium	<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 database and Stove</i>	<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 PP's</i>

			<i>efficiency testing records is controlled.</i>	<i>office. The data quality control is maintained by the PP.</i>
3.	<i>Accuracy of the measuring equipment</i>	<i>Low</i>	<i>Check the calibration records for the measurement equipment used for efficiency test.</i>	<i>The risk due to accuracy of the measuring equipment was ensured by planning to check calibration certificates of the measuring equipment used for stove efficiency (water boiling tests).</i>
4.	<i>Competence of personnel involved in conducting standardized tests viz., WBT</i>	<i>Medium</i>	<i>Interview of the personnel involved and check the training records / accreditation certificates (applicable in case of institutions) involved in conducting such tests.</i>	<i>The risk was mitigated by reviewing the training records of the personnel involved in the conducting such tests and by following the monitoring responsibilities. The training records and certificates were reviewed which also confirmed during the interviews.</i>
5.	<i>Sample</i>	<i>Medium</i>	<i>Sample size is suitable and the surveyed households at the CPA level are random.</i>	<i>Cross-check the procedure to identify the sample size against the sampling guideline and standard and confirm the sample size is calculated correctly.</i>

C.2. Consideration of materiality in conducting the verification

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The threshold of materiality was evaluated based on §13 of “Guideline: Application of materiality in verifications” Version 02.0 /B08/ and § 308 of CDM VVS for PoAs, version 02.0 /B01-1/. It was concluded that the materiality threshold applicable to the project activity based on actual emission reductions achieved is 5% of 93,378 tCO₂e which is equal to 4,669 tCO₂e.

In planning the verification, verification team took cognizance of §11 and 12 of the “Guideline: Application of materiality in verifications” Version 02.0 /B08/. A materiality threshold of 4,669 tCO₂e is determined in line with § 308 (d) of CDM VVS for PoAs, version 02.0.

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

1. Monitoring system including the data input procedure (including relevant personnel and applicable template forms used)
2. Copy of the sales/distribution agreement between household and PP (origin of data)
3. Charcoal collection agents (Agents responsible for collection and storage of charcoal produced) and sale to charcoal retailers/end-users
4. Stove unique ID system (marked on the distributed stoves)
5. ER sheet (application of data)
6. Data flow
7. Data control procedures
8. Monitoring survey records
9. Stove efficiency test (WBT) records

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

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

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

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

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

Competence of personnel involved in conducting standardized tests viz., WBT: Verification team has reviewed the abilities, qualifications and recognition of involved personnel involved in the WBT. The WBT has been carried out by the well-trained personnel and training certificate of the personnel has been provided to the verification team in this respect /9/. The training content has also been provided to the verification team. The verification team based on remote interviews and review of competency documents and training records /9/ confirms that the team was qualified to carry out the WBT in line with the protocol.

Mitigation due to error in Sampling: The verification team mitigated the risk by checking the ER sheet /4/, list of random samples /13/ generated for monitoring surveys and WBT and sample size calculation sheet /4/ and interviews with personnel responsible for the same.

In conducting the verification, DOE took cognizance of §13-17 of the "Guideline: Application of materiality in verifications" (version 02.0) /B08/ and based on the input of data from different sources checked through sampling of records during remote interviews.

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

SECTION D. Means of verification

D.1. Desk/document review

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The verification was performed primarily based on the review of the Monitoring report /1/ /2/ 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 methodologies /B02/. Documents reviewed or referenced during the verification are listed in Appendix 3 below.

D.2. On-site

In line with paragraph 321 of the VVS for PoAs, version 02 /B01-1/, the verification team noted the following for the current monitoring period:

- a) This is not the first verification for the DOE with regard to the CPA being verified during the current monitoring period;
- b) More than three years have not elapsed since the last on-site inspection was conducted for verification for the CPA; and
- c) The CPA has achieved less than 300,000 t CO₂ eq of GHG emission reductions since the last verification when an on-site inspection was conducted.

Considering the COVID-19 pandemic and domestic / international travel restrictions, the verification team opted not to conduct on-site visit for the verification which is line with paragraph 322 of the VVS for PoAs, version 02 /B01-1/.

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

The verification team has carried out remote interviews (by telephone / skype/ video calls) in order to assess the information included in the monitoring report and monitoring measurement procedures adopted during the monitoring period on 30/04/2021. During the desk review, the relevant monitoring records were checked. Previous periodic monitoring reports and verification reports, soft copy of original survey records and WBT records were used to cross check consistency of information.

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

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

Duration of on-site inspection: 30/04/2021				
No.	Activity performed on-site	Site location	Date	Team member
1.	An assessment of the implementation and operation of the registered project activity as per the registered PoA-DD, CPA-DD.	Remote interviews	30/04/2021	Sanjay Kumar Agarwalla and Pallavi Gedam
2.	A review of information flows for generating, aggregating and reporting the monitoring parameters	Remote interviews	30/04/2021	Sanjay Kumar Agarwalla and Pallavi Gedam
3.	Interviews with relevant personnel to determine whether the operational and data collection procedures are implemented in accordance with the monitoring plan in the CPA-DD	Remote interviews	30/04/2021	Sanjay Kumar Agarwalla and Pallavi Gedam
4.	A cross check between information provided in the monitoring report and data from other sources such as plant logbooks, inventories, purchase records or similar data sources	Remote interviews	30/04/2021	Sanjay Kumar Agarwalla and Pallavi Gedam
5.	A check of the monitoring equipment including calibration performance and observations of monitoring practices against the requirements of the CPA-DD and the selected methodology and corresponding tool(s), where applicable	Remote interviews	30/04/2021	Sanjay Kumar Agarwalla and Pallavi Gedam

6.	A review of calculations and assumptions made in determining the GHG data and emission reductions	Remote interviews	30/04/2021	Sanjay Kumar Agarwalla and Pallavi Gedam
7.	An identification of quality control and quality assurance procedures in place to prevent or identify and correct any errors or omissions in the reported monitoring parameters	Remote interviews	30/04/2021	Sanjay Kumar Agarwalla and Pallavi Gedam

D.3. Interviews

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1.	Banerjee	Moulindu	Sapient Infotech	30/04/2021	Project implementation and operation, monitoring procedure, data and information flow, Survey records, Sales/Distribution records, WBT procedure and records, Sampling Plan, CER waiver records and procedure, QA/QC Procedures, Management and operating system	Sanjay Kumar Agarwalla and Pallavi Gedam
2.	Dutta	Sanjit K	Sapient Infotech	30/04/2021	Project implementation and operation, monitoring procedure, data and information flow, Survey records, Sales/Distribution records, WBT procedure and records	Sanjay Kumar Agarwalla and Pallavi Gedam
3.	Sing	Ananda	Kastury Consultancy	30/04/2021	Sales/Distribution records, CER waiver records and procedure, Charcoal Production and collection	Sanjay Kumar Agarwalla and Pallavi Gedam
4.	Bor	Manoranjan	Field Assistant	30/04/2021	Charcoal collection	Sanjay Kumar Agarwalla and Pallavi Gedam
5.	Naskar	Sunil	Pavitra Dhoop	30/04/2021	Charcoal end user	Sanjay Kumar Agarwalla and Pallavi Gedam
6.	Ghosh	Gautam	Amanatran restaurant, Kolaghat	30/04/2021	Charcoal end user	Sanjay Kumar Agarwalla and Pallavi Gedam
7.	Mikolajewski	Katrin	atmosfair gGmbH	03/05/2021 (skype call)	Project implementation and operation, monitoring procedure, data and information flow, Quality Assurance – Management and operating system, Monitoring records, MR	Sanjay Kumar Agarwalla and Pallavi Gedam

					and ER calculation	
8.	Goyal	Hitesh	Nature Club of Rajasthan	30/04/2021	Project implementation and operation, monitoring procedure, data and information flow, Quality Assurance – Management and operating system, Monitoring records	Sanjay Kumar Agarwalla and Pallavi Gedam

D.4. Sampling approach

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As assessed in above sections, emission reductions for the one CPA (10526-P1-0001-CP1) are being claimed for this monitoring period and the total population of the stoves distributed are 82,589 till the end of the monitoring period.

The sampling plan implemented by the CME is in accordance with the applied approved monitoring methodologies /B02/ and the registered PoA-DD and revised CPA-DD /B04/. The CME/PP has appropriately performed Simple Random Sampling in accordance with the applied methodologies /B02/ and the monitoring plan provided in the PoA-DD /B04/ and the CPA-DD.

The sampling surveys and WBTs have been carried out by the well-trained personnel /9/. Monitoring parameters $DO_{II,G,y}$ and $fillings_{y=1}$ are monitored through monitoring sample surveys. Monitoring parameters $\eta_{new,y}$ and $load_{y=1}$ are monitored through conducting water boiling tests. Monitoring of the parameters ensures compliance with the applied methodologies AMS-II.G, version 10.0 and AMS-III.BG, version 03 /B02/. Verification team has checked the survey records /5/ and water boiling test records /11/ to confirm the test results. Parameter $DO_{II,G,y}$ monitors the drop out from total population of ICS in the monitoring period. Parameter $fillings_{y=1}$ monitors the number of fillings and $load_{y=1}$ monitors the filling size. Both the parameters $fillings_{y=1}$ and $load_{y=1}$ are used to calculate the value of the parameter $B_{y=1,new,survey}$.

CME has done a sampling for the PoA and the only CPA reported in the monitoring period, CPA 1 for the current monitoring period. A confidence/precision level of 95/10 has been used by the PP for all the 4 monitoring parameters determined through applying simple random sampling. An annual survey has been carried out. This is in accordance with the sampling plan provided in the registered PoA-DD / CPA-DD /B04/. The sample size calculations for each of the monitoring parameters monitored through the sampling have been provided in the table below. As the calculated sample size were less than 30, in accordance with the §13 of the sampling standard version 8 /B07/, a minimum sample size of 30 has been chosen when the parameter of interest is a proportion ($DO_{II,G,y}$) and Student's t-distribution has been used if the resulting sample size is less than 30 for the mean parameters ($load_{y=1}$, $fillings_{y=1}$ and $\eta_{new,i}$).

The resultant applied sample size by the PP are summarized below:

Parameters	$DO_{II,G,y}$	$fillings_{y=1}$	$load_{y=1}$	$\eta_{new,i}$
Calculated Sample Size	0	5	1	1
Applied Sample Size (to account for non-responses)	30	30	9	9
Precision achieved	0%	4.44%	0.52%	0.99%

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

- Whether the required confidence/precision has been met;
- Whether the selected sample was representative of the population.

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

DOE used sampling during verification for checking the reported values for the monitoring parameters to check the operational status, fillings sizes, load sizes and to check if the WBT tests have been done in the households. As per the sampling standard /B07/, DOE had identified 18 samples out of the PP's 30 samples for the parameters $DO_{ll,G,y}$, and $fillings_{y=1}$ and confirmed all the 9 samples for the parameters $load_{y=1}$ and $\eta_{new,j}$ based on the AQL/UQL stated below. A sample size of 18 was required, based on an AQL of 1 % and UQL of 20 %, the producer risk used is 10 % and consumer risk used was 10 %. Acceptance number (c) thus determined for the sample is 1. All the identified 18 samples had the same operational status, average load sizes and fillings as reported in the sampling frame of the CME and hence no discrepancy was found (i.e. $c=0$). All the households sampled for the monitoring parameter $\eta_{new,j}$ confirmed that the WBT tests were conducted on the stoves from those households. Thus, PP's set of records has been accepted in line with §32 of the sampling standard (version 08.0) /B07/. Verification team has cross verified these sample documents.

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

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

		baseline and/or stoves utilizing other fuel/s.	
Efficiency of improved cook stoves (ICS); Average amount of fuelwood used per filling of an ICS	Water Boiling Test as the procedure allowed for efficient test prescribed by applied CDM methodology and	Check the test reports/methods; check qualifications/ capabilities of testers;	Whether conducted by qualified institutions/testers; Whether conducted in accordance with approved established international/national standards, procedures and test methods prescribed by applicable CDM methodologies.

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

The necessary confidence / precision of 95/10 each of the parameters are met. This has been cross verified by the verification team from the supporting documents submitted /04/.

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

Areas of verification findings	No. of CL	No. of CAR	No. of FAR
General			
Compliance of the monitoring report with the monitoring report form	-	-	-
Remaining forward action requests from validation and/or previous verifications	-	-	-
CPAs considered for verification and covered in this report	-	-	-
Programme of activities	-	-	-
Compliance of the programme implementation with the registered PoA-DD	-	-	-
Implementation and operation of the management system	-	-	-
Post-registration changes	-	-	-
• 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 ¹	-	-	-
• 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	-	-	-

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

• Temporary deviations from registered monitoring plan, applied methodologies, standardized baselines or other methodological regulatory documents	-	-	-
• Corrections	01	-	-
• Changes to the start date-of the crediting period	-	-	-
• Inclusion of a monitoring plan	-	-	-
• Permanent changes to the registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines, or other methodological regulatory documents	-	-	-
• Changes to the project design	-	-	-
• Changes specific to afforestation and reforestation activities	-	-	-
Compliance of the registered monitoring plan with applied methodologies and standardized baselines	-	-	-
Compliance of monitoring activities with the registered monitoring plan	-	-	-
• Data and parameters fixed ex ante or at renewal of crediting period	-	-	-
• Data and parameters monitored	02	-	-
• Implementation of sampling plan	-	-	-
Compliance with the calibration frequency requirements for measuring instruments	01	-	-
Assessment of data and calculation of emission reductions or net removals	-	-	-
• Calculation of baseline GHG emissions or baseline net GHG removals by sinks	-	-	-
• Calculation of project GHG emissions or actual net GHG removals by sinks	-	-	-
• Calculation of leakage GHG emissions	-	-	-
• Summary of calculation of GHG emission reductions or net GHG removals by sinks	-	-	-
• Comparison of actual GHG emission reductions or net GHG removals by sinks with estimates in included CPA	-	-	-
• Remarks on difference from estimated value in included CPA	-	-	-
Assessment of reported sustainable development co-benefits	-	-	-
Global stakeholder consultation	-	-	-
Others (please specify) – <u>UNFCCC I & R</u>	-	01-	-
Total	04	01-	-

SECTION E. Verification findings

E.1. General

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

Means of verification	Document review, Interviews
Findings	--
Conclusion	<p>CME has used the Monitoring report form for CDM programme of activities, Version 03.0 which was later updated to latest available Version 04.0./B03/. Verification team confirms that the latest available version of the Monitoring report template /B03/ has been used by the CME and the MR is in compliance of the monitoring report form and instructions therein /B03/.</p> <p>CCIPL, had made the version 1, dated 22/03/2021 of the monitoring report /1/, covering the monitoring period from 01/09/2020 to 31/12/2020 (both days inclusive)</p>

	publicly available on 24/03/2021.
	This confirms compliance with the §338 and §339 of CDM VVS for PoAs, version 02.0 /B01-1/.

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

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There were 3 forward action requests from validation which were resolved during first verification.

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)
Improved cook stoves and sustainable charcoal initiative, <u>CPA 1</u> – 10516-P1-0001-CP1	Yes	26/06/2020	Version 6.0	Y

E.2. Programme of activities

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

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

E.2.2. Implementation and operation of the management system

Means of verification	Document review, Interviews
Findings	--
Conclusion	<p>The PoA management system including the record-keeping system has been explained in the registered PoA-DD /B04/. During the course of verification, verification team based on review of provided documents and remote interviews has assessed this management system. Verification team evaluated the management systems in place to implement the monitoring of the project activity. This included the roles and responsibilities of the monitoring staff, data collection, transfer and aggregation procedures, data storage and archiving procedure for the monitoring system. Monitoring surveys and WBTs were conducted by Sapient Infotech.</p> <p>Recipient household of ICS have ceded the rights of all entitlement of CERs to the</p>

CME of the PoA, this has been checked through the review of the signed sales agreements with the end users /8/ as was also cross-checked during the remote through interviews with the households. Operation of the ICSs in the CPA 1 (10516-0001) was confirmed during the interviews by the verification team. Following was confirmed during the remote interviews:

1. Stoves numbering system
2. Monitoring system including input procedure (including hard copy sales agreements with the end users)
3. Actual implementation of the stoves
4. Household-representatives were interviewed regarding the usage of stove and the sampling for the monitoring parameters $DO_{II,G,y}$, $fillings_{y=1}$, $load_{y=1}$ and $\eta_{new,j}$
5. Whether or not baseline technology was still in use
6. Process of data collection during installation of stove
7. Sales Agreements between households and CPA implementer

The charcoal generated from the households is collected by the Field Agents / [Field Assistants](#) (FAs) contracted by the PP, atmosfair gGmbH and then stored at small collection points close to the households. The charcoal is then sold to the retailers and the retailers sell it to the end users. The representatives of the project participant, charcoal collection field agents, retailers and end users were interviewed by the verification team to confirm the process. Following details were checked during the remote interviews:

1. Charcoal collection procedure (including the records by field agents)
2. Daily reports on the charcoal collected /19/
3. Contract with the charcoal retailers/ Agreement with charcoal retailers that the charcoal end users shall not be large scale industries /21/
4. Sales invoices with the charcoal retailers /19/

In order to ensure completeness and accuracy of monitoring information, electronic database is operated and maintained by the PP / CPA implementer. This information is further maintained by the PP, who verifies the reported sales with the number of stoves produced by the manufacturer and also the charcoal distributed data base with the sale invoice/receipt. The data is further periodically checked by the PP to ensure there is no double counting. This provision for the avoidance of double counting as outlined in the PoA management system has been verified by means of review records of sales database /6/ and remote interviews during the course of verification.

It was confirmed during the remote interviews and by checking the monitoring system that all the roles and responsibilities related to monitoring are fulfilled by representatives of CME / PP and the CPA implementer.

The responsibilities and authorities for monitoring and reporting are in accordance with the responsibilities and authorities stated in the monitoring plan and the revised CPA-DD /B04/.

The details about monitoring system have been provided in Section D of the Monitoring report /2/. The data flow and management and reporting structure was also checked during the remote interviews.

The verification team confirms that the monitoring management system of the CDM PoA is in place, with the responsibilities properly identified and in place. This confirms the compliance of § 340 (a) and § 347 (b) (iv) of CDM VVS PoAs. Version 02.0 /B01-1/.

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

>>

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

E.2.3.4. Changes to the programme design

>>

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

E.2.3.5. Addition of CPA inclusion template

>>

Not applicable

E.2.3.6. Change of coordination/managing entity

>>

Not applicable

E.2.3.7. Changes specific to afforestation and reforestation activities

>>

Not applicable

E.3. Component project activities

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

Means of verification	Document review, Interviews	
Findings	--	
Conclusion	The implementation status of the PoA and the component project activities is:	
	Co-ordinating and Managing entity/Project Participants:	Nature Club of Rajasthan
	Title of the PoA:	Improved cook stoves and sustainable charcoal initiative
	UNFCCC registration No:	PoA - 10516
	Applied Baseline and monitoring methodology:	AMS-II.G, Version 10, AMS-III.BG, Version 03, AMS-I. E, Version 09
	Title of the CPA:	Improved cook stoves and sustainable charcoal initiative, —CPA No-01
	CPA reference number:	10516-P1-0001-CP1
	Date of inclusion:	26/06/2020

CPA implementer	atmosfair gGmbH / Nature Club of Rajasthan
Project Scale:	Small scale
Applied Baseline and monitoring methodology:	AMS-II.G, Version 10, AMS-III.BG, Version 03
Location of the CPA:	India
CPA crediting period:	26/06/2020 to 25/06/2027
Reported monitoring Period verified in this verification:	01/09/2020 – 31/12/2020

The CPA involves the distribution of improved cooking stoves and production of charcoal from TLUD stoves in the host country India. The coordinating/managing entity for the PoA is Nature Club of Rajasthan. The technical specifications /7/ of the stove were checked by the verification team and found in accordance with the stove implemented. The numbers of stoves deployed under the CPA is 82,589 which has been confirmed through the review of the sales database /6/. All stoves reported in the monitoring and sales database and considered for issuance during this verification have been sold until 31/12/2020.

The monitored annual thermal energy savings per stove as calculated in the ER sheet /4/ is 0.0116 GWth which is less than the microscale threshold of 60 GW_{thermal}. The monitored value for the emission reductions per stove due to the type III methodology, AMS-III.BG (version 03.0) /B02/ is 1.67 tCO_{2e} per annum which is less than the microscale threshold of 20,000 tCO_{2e}.

The component project activity was implemented, and equipment installed as described in the revised CPA DD.

As a part of the remote interviews, the verification team was able to confirm that the Programme of activities and the component project activity's implementation are in accordance with the project description contained in the revised CPA-DD.

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

CC IPL's verification team considers the project description of the project contained in the registered PoA-DD and the CPA-DD to be complete and accurate.

In accordance with § 342 of CDM VVS for PoAs, version 02 /B01-1/, the verification team confirms that there is no information (data and variables) in the current monitoring period that are different from that stated in the CPA-DD which has caused an increase in the estimates of GHG emission reductions.

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

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

Parameter	Ex-ante value in the CPA-DD	Actual operation for the reported monitoring period	Assessment by the verification team
Adjusted total number of ICS of batch j operating during year y	71,325 for the year 2020	23,405 (actual number of stoves sold till the end of monitoring period is 82,589)	The number of ICS deployed in the CPA weighted by the number of days a stove is operating in the CPA

	(N _{y,j})			<p>has decreased from the ex-ante estimates. The verification team noted that this CPA is a microscale CPA without having any limit on the number of cook stoves which can be installed. The value has been cross-checked with the sales database /6/ for the dates and the number of stoves and found to be correct. This parameter has no impact on the per unit emission reductions.</p> <p>This is deemed acceptable to the verification team.</p>
	Efficiency of the device of each type <i>i</i> and batch <i>j</i> ($\eta_{new,j}$)	28%	27.13%	<p>The verification team noted that the thermal efficiencies as per the CPA-DD will be determined by Water Boiling Test (WBT) with the random sampling during the current monitoring period. The monitored thermal efficiency for cook-stoves is less than the estimated values in the CPA-DD which is deemed acceptable to the verification team.</p>
	Quantity of woody biomass used by project devices in tonnes per project device ($B_{y=1,new,survey}$)	1.69 t/year	1.64 t/year	<p>The amount of woody biomass consumption by the project device is based on the actual monitored ex-post value for the current monitoring period. The monitored value is less than the ex-ante estimated ex-ante value in the CPA-DD. As the value is based on the actual monitored values as verified with the survey records and cross checked during the remote interviews as a part of acceptance sampling and thus is deemed acceptable to the verification team.</p>
	Statistically adjusted drop out from total population of ICS in period	5 %	0%	<p>The value of the parameter has decreased from the ex-ante estimations /B04/ which causes increase</p>

	y ($DO_{II.G,y}$)			in emission reductions. The value of dropout rate was checked by the verification team through interviews for the sampled households and the responses from the households were same as the monitored value. Furthermore, verification team had asked the households the reasons for no dropouts and the sampled households responded that it was due to the fact that the project stoves helped them in the generation of income for the household, that is why no dropouts. Hence, the same is acceptable to the verification team.
	Produced quantity of charcoal in year y ($Q_{CCP,y}$)	0.34 tons/a	0.33 tons/a	Produced quantity of charcoal is lower than the ex-ante estimate value in the CPA-DD. The value is a monitored value and is determined through actual collection records. The collection records /19/ have been cross-checked with the retailer sales records /19/ and the values are comparable, as demonstrated in the ER sheet /4/.
	Emission reductions per stove/year (tCO_2)	4.28	3.99	The monitored value of the ERs per unit of stove is 3.99 tCO_2 /year /4/. ERs of 2.32 tCO_2 /year/stove is achieved on the account of applied methodology AMS-II.G (version 10.0) /B02/ the ex-ante value in the CPA-DD: 2.50. " $B_{y=1,new,survey}$," as compared to the CPA-DD value and 0 dropout rate) and 1.67 tCO_2 /year/stove is achieved on the account of applied methodology AMS-III.BG (version 03.0) /B02/ (lower than the ex-ante value in the

				CPA-DD: 1.77). However, there is no increase in the overall per unit emission reductions as compared to the ex-ante estimates.
	<p>In the opinion of CCIPL, there is no change to the project design. CCIPL's verification team confirms that the CPA are implemented within the boundary of the PoA as described in the registered PoA-DD and the implementation and operation of the project activity has been conducted in accordance with the description contained in the registered PoA-DD and CPA-DD.</p> <p>The verification team took cognizance of § 340, § 341 and § 342 of the CDM VVS for PoAs, version 02 /B01-1/ to conduct the verification and conducted a remote interviews in accordance with the § 321 and 322 of the CDM VVS for PoAs, version 02 /B01-1/.</p>			

E.3.2. Post-registration changes

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

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

E.3.2.2. Corrections

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The UNFCCC approved the PRC of the CPA DD "Improved cook stoves and sustainable charcoal initiative, CPA 1" with_CDM reference number: 10516-P1-0001-CP1 on 06/04/2021. PRC ref No. is PRC-10516-001, the effective approval date is 05/04/2021.

The following corrections in the CPA: 10516-P1-0001-CP1 are proposed and notified to UNFCCC:

Section A1:

- The evidence calculation for the Micro Scale Limit was corrected, since a wrong formula for the calculation formula was used.
- The reference to the Project standard regarding the microscale limits was corrected.

Section A3:

The stove lifetime was corrected. It now reflects the manufacturer's specifications.

Section A.7:

The history of the CPA section was corrected and missing information on similar projects implemented in the same project region was added.

Section B4.2:

- The parameter table for the NCVcharcoal was moved to the section B5.1 since it is a monitoring parameter and measurement methods and procedures for the parameter NCVcharcoal were corrected since they were not in line with the PoA DD.

Section B4.3

- The table for ex-ante emission calculation was corrected, since it did not reflect the source of data as per the monitoring plan of the CPA. It is now in line with the monitoring plan of the CPA.

Section B5.1:

- The parameter table for the parameter ty was deleted, since it is not relevant for the calculation of ER as outlined in the Monitoring Plan.

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

>>

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

E.3.2.6. Changes to the project design

>>

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

E.3.2.7. Changes specific to afforestation and reforestation activities

>>

Not applicable

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

Means of verification	Document review, Interviews
Findings	--
Conclusion	<p>The verification team is able to confirm that the monitoring plan contained in the revised CPA-DD is in accordance with the approved methodologies applied by the project activity, i.e. AMS-II. G, version 10 and AMS-III. BG. Version 03 /B02/.</p> <p>The monitoring plan is in accordance with the approved methodology, AMS-II. G, version 10.0 and AMS-III. BG, Version 03 /B02/, applied by the component project activity and as provided in the CPA-DD.</p> <p>The verification took cognizance of § 343 to § 345 of CDM VVS for PoAs, Version 02.0 /B01-1/.</p>

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

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

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

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

/B01-1/.

E.3.4.2. Data and parameters monitored

Means of verification	Document Review, Interview
Findings	CL 01 had been raised and successfully resolved. Please refer to Appendix 4 for further details.
Conclusion	<p>The Verification team confirms that the Data and parameters monitored are in compliance with the CPA-DD 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 took cognizance of § 346, § 347(c), §358 and §359 of CDM VVS for PoAs, Version 02.0 /B01-1/.</p>

E.3.4.3. Implementation of sampling plan

Means of verification	Document Review, Interview																				
Findings	CL 03 had been raised and successfully resolved. Please refer to Appendix 4 for further details.																				
Conclusion	<p>The total population of the stoves under CPA 1 considered for the monitoring period is 82,589 . The monitoring parameters required to be monitored through the sampling plan are: $DO_{II,G,y}$, $fillings_{y=1}$, $load_{y=1}$ and $\eta_{new,j}$.</p> <p>The sampling plan implemented by the CME is in accordance with the applied approved monitoring methodologies /B02/ and the registered PoA-DD/CPA-DD /B04/. The CME/PP has appropriately performed Simple Random Sampling in accordance with the applied methodologies /B02/ and the monitoring plan provided in the PoA-DD /B04/ and the CPA-DD .</p> <p>The sampling surveys and WBTs have been carried out by the well-trained personnel /9/. Monitoring parameters $DO_{II,G,y}$ and $fillings_{y=1}$ are monitored through monitoring sample surveys. Monitoring parameters $\eta_{new,y}$ and $load_{y=1}$ are monitored through conducting water boiling tests. Monitoring of the parameters ensures compliance with the applied methodologies AMS-II.G, version 10.0 and AMS-III.BG, version 03 /B02/. Verification team has checked the survey records /5/ and water boiling test records /11/ to confirm the test results. Parameter $DO_{II,G,y}$ monitors the drop out from total population of ICS in the monitoring period. Parameter $fillings_{y=1}$ monitors the number of fillings and $load_{y=1}$ monitors the filling size. Both the parameters $fillings_{y=1}$ and $load_{y=1}$ are used to calculate the value of the parameter $B_{y=1,new,survey}$.</p> <p>CME has done a sampling for the PoA and the only CPA reported in the monitoring period, CPA 1 for the current monitoring period. A confidence/precision level of 95/10 has been used by the PP for all the 4 monitoring parameters determined through applying simple random sampling. An annual survey has been carried out. This is in accordance with the sampling plan provided in the registered PoA-DD / CPA-DD /B04/. The sample size calculations for each of the monitoring parameters monitored through the sampling have been provided in the table below. As the calculated sample size were less than 30, in accordance with the §13 of the sampling standard version 8 /B07/, a minimum sample size of 30 has been chosen when the parameter of interest is a proportion ($DO_{II,G,y}$) and Student's t-distribution has been used if the resulting sample size is less than 30 for the mean parameters ($load_{y=1}$, $fillings_{y=1}$ and $\eta_{new,j}$).</p> <p>The resultant applied sample size by the CME are summarized below:</p> <table><tr><th>Parameters</th><th>$DO_{II,G,y}$</th><th>$fillings_{y=1}$</th><th>$load_{y=1}$</th><th>$\eta_{new,j}$</th></tr><tr><td>Calculated Sample Size</td><td>0</td><td>5</td><td>1</td><td>1</td></tr><tr><td>Applied Sample Size</td><td>30</td><td>30</td><td>9</td><td>9</td></tr><tr><td>Precision achieved</td><td>0%</td><td>4.44%</td><td>0.52%</td><td>0.99%</td></tr></table>	Parameters	$DO_{II,G,y}$	$fillings_{y=1}$	$load_{y=1}$	$\eta_{new,j}$	Calculated Sample Size	0	5	1	1	Applied Sample Size	30	30	9	9	Precision achieved	0%	4.44%	0.52%	0.99%
Parameters	$DO_{II,G,y}$	$fillings_{y=1}$	$load_{y=1}$	$\eta_{new,j}$																	
Calculated Sample Size	0	5	1	1																	
Applied Sample Size	30	30	9	9																	
Precision achieved	0%	4.44%	0.52%	0.99%																	

	<p>Applying the random number generator, the ICS were randomly picked from the defined population upto the required sample size as calculated by the PP. The verification team confirms that the applied method for sample size calculation is in accordance with the PoA-DD / CPA-DD /B04/.</p> <p>As per paragraph 25 of the Sampling Standard, version 08 /B07/, the verification team has to verify whether the project participants or the coordinating/managing entity have implemented the sampling and surveys according to the sampling plan in the registered monitoring plan. The verification includes determining:</p> <p>(a) Whether the required confidence/precision has been met;</p> <p>(b) Whether the selected sample was representative of the population.</p> <p>In line with paragraph 26 of the Sampling Standard, the verification team has applied a sampling approach for remote interviews as part of verification. Now as the CME had applied sampling approach, the verification team has chosen acceptance sampling in accordance with paragraph 28 of the sampling standard /B07/.</p> <p>DOE used sampling during verification for checking the reported values for the monitoring parameters to check the operational status, fillings sizes, load sizes and to check if the WBT tests have been done in the households. As per the sampling standard /B07/, DOE had identified 18 samples out of the PP's 30 samples for the parameters $DO_{II,G,y}$ and $fillings_{y=1}$ and confirmed all the 9 samples for the parameters $load_{y=1}$ and $\eta_{new,j}$ based on the AQL/UQL stated below. A sample size of 18 was required, based on an AQL of 1 % and UQL of 20 %, the producer risk used is 10 % and consumer risk used was 10 %. Acceptance number (c) thus determined for the sample is 1. All the identified 18 samples had the same operational status, average load sizes and fillings as reported in the sampling frame of the CME and hence no discrepancy was found (i.e. $c=0$). All the households sampled for the monitoring parameter $\eta_{new,j}$ confirmed that the WBT tests were conducted on the stoves from those households. Thus, PP's set of records has been accepted in line with §32 of the sampling standard (version 08.0) /B07/. Verification team has cross verified these sample documents.</p> <p>Please also refer to the assessment provided in Appendix 7 of this report.</p> <p>The verification took cognizance of § 348 of CDM VVS for PoAs, Version 02.0 /B01-1/.</p>
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E.3.5. Compliance with the calibration frequency requirements for measuring instruments

Means of verification	Document Review, Interview
Findings	CL 04 was raised and successfully resolved. Please refer to Appendix 4 for further details.
Conclusion	<p>The stove efficiency ($\eta_{new,j}$) has been measured by the use of measuring equipment. The stove efficiency testing has been done by WBTs conducted in line with the guidance provided in the PoA-DD/CPA-DD /B04/. The monitoring equipment used for conducting the stove efficiencies by WBTs are digital thermometer, weigh balance and moisture meter. All monitoring equipment used for the water boiling tests had valid calibration certificates at the time of their usage which was checked through the review of the calibration certificates /12/. The personnel carrying out the WBTs have been trained as demonstrated by the WBT training certificates for the concerned personnel /9/. The appropriate QA/QC procedures have been followed for the monitoring parameter.</p> <p>The parameter produced quantity of charcoal in year y ($Q_{CCP,y}$) has been calculated by direct measurement of the charcoal quantity collected/sold. The weighing balance used for the measurement of the charcoal quantity were checked by the verification team. The weighing balance used for measurement of the charcoal is calibrated annually and the calibration certificates /9/ for the weighing balance have been provided to the verification team.</p> <p>The verification took cognizance of section 10.2.6 of CDM VVS for PoAs (version</p>

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

In line with the requirement of § 358 and § 359 of CDM VVS for PoAs, Version 02.0 /B01-1/, the verification team has reviewed the Monitoring report /2/ and ER spread sheets /4/ to check the arithmetic calculation of the emission reductions. The equation used for the calculation is compared with those provided in the revised CPA-DD /15/ and the methodology AMS-II.G, Version 10, and AMS-III.BG, Version 03 /B02/.

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

Means of verification	Document Review, Interview
Findings	--
Conclusion	<p>The equations for baseline emissions, as provided in the Monitoring report /02/ and confirmed with the CPA-DD /B04/ and the methodologies AMS-II.G, Version 10 and AMS-III. BG, Version 03 /B02/, are:</p> $ER_{total} = ER_{II.G} + ER_{III.BG}$ <p>Where:</p> <p>ER_{total} Total emission reductions of the CPA $ER_{II.G}$ Emission reductions of the stove efficiency component $ER_{III.BG}$ Emission reductions of the charcoal generation component</p> <p>Emission reductions from the Stove Efficiency Improvements Component (AMS-II.G)</p> $ER_{II.G,y} = \sum_i \sum_j ER_{II.G,y,i,j} - LE_y$ <p>Where:</p> <p>i Indices for the situation where more than one type of project device is introduced to replace the pre-project devices 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</p> $ER_{II.G,y,i,j} = B_{y,savings,i,j} \times N_{y,i,j} \times \mu_{y,i,j} \times f_{NRB,y} \times NCV_{biomass} \times EF_{projected_fossil\ fuel}$ <p>Where:</p> <p>$B_{y,savings,i,j}$ = Quantity of woody biomass that is saved in tonnes per cook stove device of type i and batch j during year y</p> <p>$f_{NRB,y}$ = Fraction of woody biomass that can be established as non-renewable biomass using survey methods or government data or default country specific fraction of non-renewable woody biomass (fNRB) values available on the CDM website.</p> <p>$NCV_{biomass}$ = Net calorific value of the non-renewable woody biomass that is substituted (IPCC default for wood fuel, 0.0156 TJ/tonne, based on the gross weight of the wood that is 'air-dried')</p> <p>$EF_{projected_fossil\ fuel}$ = Emission factor for the fossil fuels projected to be used for substitution of non-renewable woody biomass by similar consumers. Use a value of 63.7 t CO₂/TJ</p> <p>$N_{y,i,j}$ = Number of project devices of type i and batch j operating during year y,</p>

$\mu_{y,i,j}$ = Adjustment to account for any continued use of pre-project devices during the year y . Set to one according to AMS-II.G par 17.

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

Where:

$B_{y=1,new,i,survey}$ = Quantity of woody biomass used by project devices in tonnes device of type i .

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

$\eta_{new,i,j}$ = Efficiency of the project device i and batch j .
Charcoal generated in the ICS will not be considered to derive if this charcoal will be used outside the ICS, according to AMS-III.BG.

The formula used for emission reductions on account of the methodology AMS-III.BG, version 3 /B02/. AMS-III.BG gives the following baseline formula:

$$ER_{III.BG,y} = \sum_i Q_{CCP,i,y} \times \left[\left(CF \times NCV_{wood} \times \frac{NCV_{charcoal}}{NCV_{charcoal,default}} \times f_{NRB,BL,wood} \times EF_{projected_fossilfuel} \right) + (SMG_{y,b} - M_d) \times (1 - f_{NRB,BL,wood}) \times GWP_{CH_4,y} \right] - PE_{y,fugitive} - PE_{y,flaring} - PE_{FF,y} - PE_{GL,y} - PE_{BC,y}$$

Where

$ER_{III.BG,y}$ = Emission reductions in year y (t CO₂e/yr)

$Q_{CCP,i,y}$ = Quantity of charcoal type i produced and used in year y (t)

CF = Default wood to charcoal conversion factor

NCV_{wood} = Net calorific value of wood (TJ/t)

$NCV_{charcoal}$ = Net calorific value of the charcoal produced during the project (TJ/t)

$NCV_{charcoal,default}$ = Default net calorific value of charcoal (TJ/t)

$f_{NRB,BL,wood}$ = Fraction of biomass used in the absence of the project activity that can be established as non-renewable biomass; determined as per the procedure found in the latest version of AMS-I.E. Determined here as described in this section B.6.1 under AMS-II.G.

$EF_{projected_fossilfuel}$ = Emission factor for the substitution of non-renewable woody biomass by similar consumers (t CO₂/TJ)

$GWP_{CH_4,y}$ = Global warming potential of methane applicable to the crediting period (t CO₂e/t CH₄)

	<p>$SMG_{y,b}$ = Specific methane generation for the baseline charcoal generation process in the year y; a default value of 0.030 t CH₄/t charcoal may be used.</p> <p>M_d = Factor to account for any legal requirement for capture and destruction of methane in the charcoal production facility (tonne of CH₄/tonne of raw material)</p> <p>$PE_{y,flaring}$ = If applicable, emissions due to the flare inefficiency. In case captured pyrolysis gas is gainfully used (e.g. used for production of heat as in the case of micro-gasifier), then it can be taken as zero.</p> <p>$PE_{FF,y}$ = Project emissions due to fossil fuel consumption in charcoal production facilities in year y (t CO₂)</p> <p>$PE_{El,y}$ = Project emissions due to electricity consumption in charcoal production facilities in year y (t CO₂)</p> <p>$PE_{BC,y}$ = Project emissions due to biomass cultivation in year y (t CO₂)</p> <p>$PE_{y,flaring}$ is not applicable since pyrolysis gas is used for cooking. M_d is set to zero since there is obviously no legal requirement to capture methane in micro gasifier stoves. $PE_{FF,y}$ and $PE_{El,y}$ are not considered since no fossil fuels or electricity are used in the ICS; $PE_{BC,y}$ is not applicable since no biomass will be cultivated for charcoal production since it is produced as a by-product of daily cooking.</p> <p>$Q_{CCP,i,y}$ = Quantity of charcoal type i produced and used in year y (t)</p> <p>$PE_{y,fugitive}$ is calculated as follows :</p> $PE_{y,fugitive} = \sum_i Q_{CCP,i,y} \times GWP_{CH_4,y} \times SMG_{y,b} \times f$ <p>Where:</p> <p>$PE_{y,fugitive}$ = Fugitive emissions from operation of charco producing facility (physical leakage) in the year y (CO₂e)</p> <p>f = A fraction attributed to project charcoal production technology, use a default value of 0.1.</p> <p>$Q_{ccp,i,j}$ = Quantity of charcoal type i produced and used in (t)</p> <p>From the above equation and the parameter values, emission reductions are calculated as 93,378 tCO₂e.</p> <p>The verification team confirms that the calculation of baseline emission and emission reductions is in accordance with the applied methodological equations and the PoA-DD/CPA-DD. Calculations have been checked and confirmed from the ER spread sheet /4/.</p> <p>The verification took cognizance of § 358 of CDM VVS for PoAs, version 02.0 /B01-1/.</p>
--	--

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

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

the CPA-DD /B04/.

E.3.6.3. Calculation of leakage GHG emissions

Means of verification	Document Review, Interview
Findings	-
Conclusion	<p>Net-to-gross adjustment factors for leakage (fixed default values of 0.95 as per AMS II.G. version 10.0) /B02/ was applied to the project activity to calculate Emission Reductions of this Monitoring Period.</p> <p>Verification team confirms that all parameters are used correctly in the calculations, all results are verifiable and transparent, all assumptions are described and based on verifiable evidence and calculations are done in accordance with the pre-defined formulae from CPA-DD.</p>

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

Means of verification	Document Review, Interview
Findings	-
Conclusion	<p>The verification team confirms that all parameters are used correctly in the calculations, all results are verifiable and transparent, all assumptions are described and based on verifiable evidence and calculations are done in accordance with the pre-defined formulae from CPA-DD. The total number of ERs achieved during the monitoring period is 93,378 tCO₂e.</p> <p>In summary, verification team confirms that actual emission reduction is lower than the estimate of the CPA-DD /B04/ for the current monitoring period.</p> <p>The verification took cognizance of § 358 of CDM VVS PoAs, version 02 /B01-1/.</p>

Title and UNFCCC reference number of the CPA	Baseline emissions or baseline net GHG removals by sinks (tCO ₂ e)	Project emissions or actual net GHG removals by sinks (tCO ₂ e)	Leakage (tCO ₂ e)	GHG emission reductions or net GHG removals by sinks (tCO ₂ e)		
				Amount achieved before 1 January 2013	Amount achieved from 1 January 2013	Amount achieved in the entire monitoring period
10516-P1-0001-CP1	93,378	-	-	0	93,378	93,378
Total	93,378	0	0	0	93,378	93,378

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

Means of verification	Document Review
Findings	-
Conclusion	Comparison of the actual GHG emission reductions with the estimates in the included specific CPAs is given in the below table. The verification team took cognizance of § 358 of CDM VVS for PoAs, version 02 /B01-1/.

Title and UNFCCC reference number of the CPA	Actual values achieved by the CPAs during this monitoring period	Value estimated in ex ante calculation in the included CPA-DD(s)
10516-P1-0001-CP1	93,378	101,758
Total	93,378	101,758

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

Means of verification	Document review
Findings	-

Conclusion	The actual emission reductions are less than the ex-ante estimated values in the CPA-DD.
-------------------	--

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

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

E.3.8. Global stakeholder consultation

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

SECTION F. Internal quality control

>>

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

SECTION G. Verification opinion

>>

Carbon Check (India) Private Ltd. has performed the second periodic verification of the registered CDM Programme of Activities "Improved cook stoves and sustainable charcoal initiative" in India (hereafter referred to as "Programme of Activities or PoA") for the CPA titled "Improved cook stoves and sustainable charcoal initiative – CPA 1".

The verification team assigned by the DOE concludes that the PoA-DD (Version 6.0, dated 09/03/2020), CPA 10516-P1-0001-CP1 as described in the revised CPA-DD –and the Monitoring report (Version 34, dated 204/058/2021) /2/, meet all relevant requirements of the UNFCCC for CDM project activities including article 12 of the Kyoto Protocol and paragraph 62 of CDM M& P, the modalities and procedures for CDM (Marrakesh Accords) and the subsequent decisions by the COP/MOP and CDM Executive Board. The verification has been conducted in-line with the CDM VVS for programme of activities requirements version 02.0 /B01-1/.

Verification methodology and process:

The Verification team confirms the contractual relationship signed on 02/03/2021 between the DOE, Carbon Check (India) Private Ltd. and the Project Participant, (atmosfair gGmbH). The team assigned to the verification meets the Carbon Check (India) Private Ltd.'s internal procedures including the UNFCCC requirements for the team composition and competence.

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

- Reviewing the registered PoA-DD (Version 6.0, date 09/03/2020), the CPA DD for 10516-P1-0001-CP1 including the monitoring plan and the corresponding validation report/s /B04/;
- Review of the revised CPA-DD
- Publication of the MR on the UNFCCC website (version 1.0, 22/03/2021) on 24/03/2021;
- Desk review of the validation report, MR and other relevant documents including documents related to the project activities in emission reductions
- Review of the applied monitoring methodologies (AMS-II.G, version 10 and AMS-III.BG, version 3);
- Review of any CMP and EB decisions, clarifications and guidance;

- Remote Interviews on 30/04/2021
- Resolution of CARs and CLs raised during verification
- Issuance of Verification Report

The CPA was correctly implemented according to the selected monitoring methodologies, monitoring plan and the CPA-DD. The monitoring system was installed, maintained in a proper manner, while collected monitoring data allowed for the verification of the amount of achieved GHG emission reductions. Through the review and remote interviews, the verification team confirms that the PoA has resulted in the 93,378 tCO₂e emission reductions during the second monitoring period for CPA 1.

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

Item	Amount before 1 January 2013	Amount from 1 January 2013 until 31 December 2020	Amount from 1 January 2021
Emission reductions (t CO ₂ e)	-	93,378	-

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

SECTION H. Certification statement

>>

Carbon Check (India) Private Ltd., the DOE, has performed the verification of the registered Programme of Activities, UNFCCC Registration Number 10516, "Improved cook stoves and sustainable charcoal initiative" in India. The PoA involves replacement of less efficient cooking stoves using woody biomass with ICS which are more efficient micro wood gasifier and produce conventional charcoal. The ICS distributed under CPA of the PoA are more efficient in transferring heat from the fuel to the pot when compared to the stoves typically used in baseline. By replacing inefficient stoves, the PoA will save on consumption of woody biomass and improve the indoor air quality.

The CPA of the PoA is designed to generate emission reductions by distribution of the fuel-efficient fuel wood based cook stoves in India. The CME and CPA implementer are responsible for the collection of data in accordance with the monitoring plan and the reporting of GHG emissions reductions from the component project activity/ies. It is DOE's responsibility to express an independent verification statement on the reported GHG emission reductions from the component project/s. The DOE does not express any opinion on the selected baseline scenario or on the validated and registered PoA-DD/CPA-DD. The verification is carried out in-line with the VVS requirements.

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

The verification is based on:

- PoA-DD Version 6.0 dated 09/03/2020 and the included CPA-DD including their validation reports /B04/;
- Revised CPA-DD

- Approved monitoring methodology AMS-II.G “Energy efficiency measures in thermal applications of non-renewable biomass”, Version 10; and AMS–III.BG., “Emission reduction through sustainable charcoal production and consumption” Version 03
- Monitoring reports Version 1, 2, ~~and 3~~ and 4 dated 22/03/2021, 05/05/2021, ~~and 20/05/2021~~ and 24/08/2021 respectively.

This statement covers verification period from 01/09/2020 – 31/12/2020 (both dates included)

The DOE had raised 4 clarifications and 1 corrective action request which have been resolved by the CME.

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

The DOE, hereby certifies that the project activity, achieved emission reductions by sources of GHG equal to 93,378 tCO₂e and all monitoring requirements have been fulfilled and is substantiated by an audit trail that contains evidence and records. The break-up of emission reduction up-to 31/12/2012 and 01/01/2013 onwards as verified during the course of verification are as below:

Item	Amount before 1 January 2013	Amount from 1 January 2013 until 31 December 2020	Amount from 1 January 2021
Emission reductions (t CO ₂ e)	-	93,378	-

Appendix 1. Abbreviations

Abbreviations	Full texts
AQL	Acceptable Quality Limit
CDM	Clean Development Mechanism
CER	Certified Emission Reduction
CAR	Corrective Action Request
CC IPL	Carbon Check (India) Private Ltd.
CER	Certified Emission Reduction
CL	Clarification Request
CME	Co-ordinating and Managing entity
CPA	Component Project Activity
CPA-DD	Component Project Activity Design Document
CO ₂	Carbon Dioxide
CO ₂ e	Carbon Dioxide Equivalent
DR	Document review
DOE	Designated Operational Entities
DVR	Draft Verification Report
EB	CDM Executive Board
EF	Emission Factor
EI	External individual
FA	Final Approval
<u>FA</u>	<u>Field Assistant / Field Agent</u>
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
MP	Monitoring Period
MWh	Mega Watt Hour
MR	Monitoring Report
NCR	Nature Club of Rajasthan
PoA	Programme of Activities
PoA-DD	Programme of Activities Design Document
PP	Project Participant
QC/QA	Quality control /Quality assurance
TA	Technical Area
TR	Technical Review
UNFCCC	United Nations Framework Convention on Climate Change
UQL	Unacceptable Quality Limit
VVS	Validation and Verification Standard
WBT	Water boiling test

Appendix 2. Competence of team members and technical reviewers



Carbon Check (India) Private Ltd.

Sanjay Agarwalla

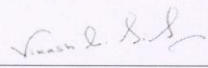
has been qualified as per CCIPL's internal qualification procedures, in accordance with requirements of Accreditation Standard (version 07.0):

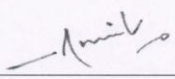
For following functions:

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

In the following Technical Areas:

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


Mr. Vikash Kumar Singh
Compliance Officer


Mr. Amit Anand
CEO

Date of Approval
24/12/2020

Valid Till
24/12/2021

Revision History of the Document

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

¹ India

CARBON CHECK (INDIA) PRIVATE LIMITED
CIN: U74930DL2012PTC232495

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Vikash Kumar Singh

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Verifier	<input checked="" type="checkbox"/>	Technical Expert	<input checked="" type="checkbox"/>	Local Assessor ¹	<input checked="" type="checkbox"/>

In the following Technical Areas:

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

Mr. Amit Anand
CEO

Date of Approval
24/12/2020

Valid Till
24/12/2021

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24/12/2018	Annual Revision
24/12/2019	Annual Revision
01/03/2020	Interim Revision for office address change
01/09/2020	Interim Revision for CCIPL logo change
24/12/2020	Annual Revision

¹ India, South Africa

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Carbon Check (India) Private Ltd.

Ramchandra Nesari

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

For following functions:

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

In the following Technical Areas:

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

Mr. Vikash Kumar Singh
Compliance Officer

Date of Approval
24/12/2020

Mr. Amit Anand
CEO

Valid Till
24/12/2021

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26/12/2014	Initial Adoption
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24/12/2019	Annual Revision
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01/09/2020	Interim Revision for CCIPL logo change
24/12/2020	Annual Revision

¹ India.

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Tel: +91 120 4373114 | URL: www.carboncheck.co.in | e-mail: info@carboncheck.co.in

Appendix 3. Documents reviewed or referenced

No.	Author	Title	References to the document	Provider
1	atmosfair <u>on behalf of CME</u>	- Webhosted Monitoring report - <u>Interim Monitoring report</u> - <u>Monitoring report</u>	Version 1, dated 22/03/2021 Version 2, dated 05/05/2021 <u>Version 3, dated 20/05/2021</u>	<u>CME via PP</u>
2	atmosfair <u>on behalf of CME</u>	Final Monitoring report	Version 34 , dated 204/058 /2021	<u>CME via PP</u>
3	atmosfair	Emission reduction calculation spread sheet corresponding to /1/	-	<u>CME via PP</u>
4	atmosfair	Emission reduction calculation spread sheet corresponding to /2/	<u>-version 4, dated 19/08/2021</u>	<u>CME via PP</u>
5	Sapient	Survey records for the monitoring period	-	PP
6	atmosfair	CPA distribution records including evidence for the dates of distribution	-	PP
7	Sapient	Stove specifications	-	PP
8	Sapient	Sample stoves sales receipt / user agreement	-	PP
9	atmosfair	Training records and competence of monitoring team (Survey and WBT)	-	PP
10	A atmosfair / Sapient / NCR	<u>i.</u> Copy of contract in between CME/PP/CPA implementer and Sapient <u>ii.</u> Contract in between Sapient, Kastury, Quality Enterprise	-	PP
11	Sapient	Water boiling test records (original raw data records and calculation spread sheets)	-	PP
12	Metrology Dept. / Nutech Calibrators and engineers	Calibration records for the monitoring equipment (weigh balance for charcoal and weigh balance, thermometer & moisture meter for WBT)	-	PP
13	atmosfair	Evidence for random number generator for sampling	-	PP
14	Clean Cooking Alliance	WBT conducting methodology/protocol for the cook stoves	Version 4.2.3	PP
15	Sapient	- Evidence for "Charcoal users will sign agreements stating that they will not claim ER for the use of the charcoal provided under this CPA".	-	
16	Sapient	Copies of the contracts with stove manufacturer including Manufacturing inventory sheets	-	PP
17	ESKAPS India Pvt. Ltd.	Laboratory report for NCV of charcoal	-	PP
18	atmosfair	Sample size calculation sheet along with actual samples conducted and the reliability assessment (provided in ER spread sheet)	-	PP

19	atmosfair	Charcoal database Invoice/receipts for Charcoal sale including Charcoal Daily report from the Field Agents for the monitoring period	-	PP
20	atmosfair	Employment records of charcoal collection field agents	-	PP
21	Sapient	Evidence for Eligibility criterion 11: <i>"Samples of agreements to be signed with ICS users, confirming that traditional wood stoves were used for cooking in the baseline situation and samples of agreements to be signed with charcoal buyers, shortly describing their business and confirming that they are no large scale industries"</i> .	-	PP
22	Sapient	Evidence for "Charcoal users will sign agreements stating that they will not claim ER for the use of the charcoal provided under this CPA".	-	PP
23	<u>Charcoal end users</u>	Evidence for: AMS III.B.G para 4: End users of charcoal shall be: (i) households; or (ii) small and medium enterprises (SMEs); or (iii) a group of households served by a charcoal market (e.g. charcoal consuming urban areas). End users do not include large scale industries.	=	PP
<u>24</u>	<u>atmosfair</u>	<u>Prior consideration Form for the PoA submitted to UNFCCC and Host party DNA</u>	<u>07/06/2021</u>	<u>PP</u>
<u>25</u>	<u>atmosfair</u>	<u>Invitation letter for Local Stakeholders meeting</u>	=	PP
B01	UNFCCC	1.Validation and Verification Standard for PoAs, version 02 2.Project Standard for PoAs, version 02 3.Project Cycle Procedure for PoAs, version 02	http://cdm.unfccc.int/	Others
B02	UNFCCC	Applied baseline and monitoring methodologies, AMS-II.G, version 10.0 and AMS-III.BG, version 03	http://cdm.unfccc.int/	Others
B03	UNFCCC	Instructions for filling out the monitoring report form for CDM programme of activities, version 03.0 and version 04.	http://cdm.unfccc.int/	Others
B04	UNFCCC	- Registered PoA-DD, Version 6.0 dated 09/03/2020; - Revised and approved CPA-DD (CPA1) 10516-P1-0001-CP1 , Version 5, dated 29/01/2021 Validation opinion for PRC in CPA-DD (CPA 1) Version 02, dated 02/02/2021	http://cdm.unfccc.int/	Others
B05	Web sites	Websites:	--	Others

		http://cdm.unfccc.int/ http://www.ipcc-nggip.iges.or.jp/ http://www.pciaonline.org/testing		
B06	UNFCCC	Guidelines: Sampling and surveys for CDM project activities and programmes of activities, Version 04.0	http://cdm.unfccc.int/	Others
B07	UNFCCC	Standard: Sampling and surveys for CDM project activities and programmes of activities, version 08.0	http://cdm.unfccc.int/	Others
B08	UNFCCC	Guideline: Application of materiality in verifications" Version 02.0	http://cdm.unfccc.int/	Others

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

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

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

Table 2. CLs from this verification

CL ID	01	Section no.	E.3.4.2	Date: 05/05/2021
Description of CL				
In the Emission reduction spread sheet under charcoal data, value of data in cell B13 does not match with the supporting document provided. Also in few places in the spread sheet, MP1 is referred whereas the verification is being performed for MP2. CME needs to clarify.				
CME response				Date: 05/05/2021
PP provided the correct supporting document to show correctness of the value provided in cell B13 of the Emission reduction spread sheet under charcoal data. PP corrected the typos in the ER sheet for MP2, e.g. reference to MP1.				
Documentation provided by the CME				
Version 2 of the ER spreadsheet Last page of the PM charcoal collection sheet including the reported sum of the collected charcoal.				
DOE assessment				Date: 05/05/2021
CME has provided the supporting documents in regards with the charcoal data, and also provided the revised Emission reduction spread sheet, which is checked and confirmed by the verification team. Hence CL 01 is closed.				

CL ID	02	Section no.	E.3.2.2	Date: 05/05/2021
Description of CL				
In MR section C.3.2, the PRC approval date is not stated.				
CME response				Date: 05/05/2021
PP included the approval date and the effective approval date of the PRC.				

Documentation provided by the CME	
DOE assessment	Date: 05/05/2021
CME has stated the PRC approval date in the revised MR, which is checked and confirmed by the verification team. Hence CL 02 is closed.	

CL ID	03	Section no.	E.3.4.3	Date: 05/05/2021
Description of CL				
As per the "Randomizer_POA 10516_CPA1_MP1_KaMi_19022021" the total stove distributed number is 82,788, whereas the MR and sales data show 82,589. CME to clarify the same.				
CME response				Date: 05/05/2021
After the sample was drawn using the randomizer, some of the stoves were taken out of the database for the ER of the Monitoring Period, due to some unclear status in the internal database check. NO new sample was drawn, since the removed stoves were not part of the sample. Therefore, the randomizer has few more stoves than the sales data considered for the ER calculations.				
Documentation provided by the CME				
-				
DOE assessment				Date:
Clarification provided by CME is acceptable to the verification team Hence CL 03 is closed.				

CL ID	04	Section no.	E.3.5	Date: 19/05/2021
Description of CL				
In section E.2 of the MR: Data and parameters monitored, calibration dates of instruments for measurements of $B_{y=1,new,survey}$, weighing instrument for calculating $\eta_{new,j}$, and $Q_{CCP,i,y}$ are mentioned as 21/01/2021, which is beyond the monitoring period. The calibrated instruments must have validity covering MP. Clarification is requested.				
CME response				Date: 20/05/2021
PP revised the calibration information for the weigh scales used for the regular monitoring of the charcoal during the MP. PP now provided calibration information valid for the entire MP. Regarding the calibration equipment used for the WBT and thus the determination of the parameters $B_{y=1,new,survey}$ and $\eta_{new,j}$, PP considers it appropriate to use the calibration certificates dated on 21/01/2021, because the measurements for these parameters was done only once after the end of the MR and after the mentioned calibration date.				
Documentation provided by the CME				
Revised MR				
DOE assessment				Date: 21/05/2021
It is noted that measurements for parameters for WBTs ($\eta_{new,j}$) and $B_{y=1,new,survey}$ ($load_{y=1}$) for the current monitoring period were conducted in March 2021 (after the end date of the monitoring period on 31/12/2020). The weigh balance and thermometer used were having the calibration validity at the time of monitoring. The verification team confirms that all the monitoring equipment used for the current monitoring period were having their calibration validity at the time of their usage.				

Table 3. CARs from this verification

CAR ID	01	Section no.	UNFCCC I & R check	Date: 28/07/2021
Description of CAR				
1: The PoA view page indicates CME as Nature Club of Rajasthan and PP as Atmosfair gGmbH. Further, Appendix 3 of the verification report indicates that the monitoring report was provided by Atmosfair gGmbH (the PP). The DOE shall provide information how it complied with (a) paragraph 208 of PCP-PoA ver. 02 which requires that it's the CME who shall prepare and submit the monitoring report to the verifying DOE and (b) paragraph 296 of VVS-PoA ver. 01 which requires that the DOE shall make public a monitoring report received from the CME.				
2: The DOE has verified that the parameter "Quantity of woody biomass used by project devices in tonnes per project device ($B_{y=1,new,survey}$)" was determined based on questionnaires to the households. However, no information on how the DOE confirmed that the pre-project devices have been completely decommissioned and only micro-gasifiers are exclusively used in the project households in order to determine the $B_{y=1,new,survey}$ based on questionnaires (please refer to AMS-II.G ver. 10, Parameter table 15- measurement procedures).				
3: The applied methodology (AMS-III.B ver. 03, parameter Table 8-QA/QC procedures) requires to check the				

consistency of the NCVcharcoal,i measurements by comparing the measurement results with, relevant data sources (e.g. values in the literature, values used in the national GHG inventory) and default values by the IPCC. However, the monitoring and verification reports do not contain this information.

4: The DOE interviewed the CME representatives and collection field agents to verify the amount of charcoal produced by the project activity. The DOE shall provide information on how it verified that no other charcoal was supplied from sources other than the PoA devices and that the records from the collection agents only reflect charcoal from the PoA devices considering that another PoA (10292) shares the same geographical boundary (West Bengal) and the same technology (TLUD micro gasifiers) as this CPA (refer to the CPA-DD page 12).

5: The PoA view page indicates CME as Nature Club of Rajasthan. However, the CPA-DD (page 48) indicates that the PoA device producer and manufacturer (Sapient) invited the local stakeholders to provide comments on the proposed CDM PoA whereas the PS-PoA ver. 02 paragraph 51 requires that invitation is through the CME and VVS-PoA ver. 02 paragraph 294 which requires the verification DOE to check compliance of the included CPAs with the CDM requirements.

CME response

Date: 19/08/2021

1: CME clarifies that the CME authorized atmosfair to send the monitoring report to the DOE on their behalf in a written agreement. The agreement was provided to the DOE.

The CME confirms that Mr. Hitesh Goyal (representative of the CME) was copied in the submission of the monitoring report and in all communications with the DOE regarding the PoA.

2: The parameter By=1,new,survey is determined through interviews and measurements, since it is calculated by two factors: "fillingsy" and "loady". Only the first factor is determined by interviews, while loady is determined annually through measurement campaigns during the monitoring by the water boiling tests. The PP also provided questionnaires carried out in all households covered during the monitoring campaigns for MP1 and MP2 in which users confirm that the pre-project device was completely decommissioned and that no other stoves is used for cooking than the project device.
We have included the information in the Monitoring report.

3: The value of the parameter NCVcharcoal,i was determined as 28.58 GJ/t.
The IPCC default value for NCV charcoal is 29.5 GJ/t. According to the IPCC Section 1.5.2 (page 1.25, <https://www.ipcc-nggip.iges.or.jp/public/2006gl/vol2.html>): "If no further data are available, the recommended default uncertainty range for fossil fuel combustion data should be assumed to be plus or minus 5 percent. In other words:

- The value in the energy statistics or energy balance is interpreted as the point estimate for the activity data
- The lower limit value of the 95 percent confidence interval is 0.95 times the point estimate;
- The upper limit value of the 95 percent confidence interval is 1.05 times this value"

Meaning the uncertainty range is $0.95 \times 29.5 \text{ GJ/t} - 1.05 \times 29.5 = 28.025 - 30.975 \text{ GJ/t}$.

Our measured value is within this range for charcoal given by the IPCC and is therefore deemed acceptable.

The Engineering ToolBox² states the NCV value for Charcoal at 28.4 GJ/t, which is also in the rage of our value.

We have included the information in the Monitoring report.

4: The amount of collected and sold charcoal to end users have been cross-checked for plausibility according to the PDD:

"There will be cross checks with:

- total quantity of charcoal generated by the micro gasifiers based on monitored fuelwood consumption and the observed conversion-rate to charcoal.
- the average amounts of charcoal collected from stove users based on records of field assistant collecting charcoal"

The quantity of charcoal generated by the micro gasifiers was calculated as: monitored fuelwood

² The Engineering ToolBox, (2003). Fuels - Higher and Lower Calorific Values. [online] Available at: https://www.engineeringtoolbox.com/fuels-higher-calorific-values-d_169.html [Accessed 24.08.2021].

consumption * observed conversion-rate to charcoal as gained by the WBT. Quantity of charcoal generated = 1.64 t/a * 21.78% = 0.36t/a.

We have included this calculation in the ER spreadsheet.

The average amount of charcoal collected from stove users based on records of field assistant collecting charcoal was 0.3310 t/a (data included in the ER calculation spreadsheet).

The amount of replaced charcoal per stove per year is 0.3308 t/a.

This shows that there is more charcoal produced by the project devices and collected from the households than sold to the charcoal end users. The higher values for charcoal generation and collection are due to loss of charcoal through sorting, cleaning and transport.

Thus, the amount of charcoal sold to the charcoal end users for replacement of the conventional charcoal is reasonable and no additional charcoal was introduced in the project.

The CME confirms and provided documents to show that the charcoal collection lines for PoA10292 and PoA10516 are completely separate. The Field assistants who collect the charcoal from the users are allocated to certain households and each field assistant only collects the charcoal for these certain households. The PP provided the collection lists of the charcoal including the names and signatures of the respective field assistants. From these documents it can clearly be seen that no field assistant works for both projects. The field assistants employed under PoA10292 and PoA10516 are different. This way it is made sure that no charcoal from households under the PoA10292 is collected for PoA10516 and vice versa.

All invoices and charcoal collection sheets for the respective projects show the unique UN project number for correct allocation of the charcoal amounts to the project. No charcoal from PoA10292 was sold under PoA 10516. This shows that the charcoal collection lines of the two PoAs are separated and the collected charcoal is kept separate for the two PoAs.

The plausibility check on the amount of generated charcoal in the project devices and the documentation of the strict separation of the charcoal collection systems of PoA 10292 and PoA10516 show, that only charcoal generated from the project devices of PoA 10516 was supplied to the charcoal end users.

5: Originally atmosfair gGmbH was planned to act as CME. This is confirmed in the Prior Consideration Form submitted to the host county DNA and the UNFCCC, where atmosfair was named CME. The form was provided to the DOE.

At the time of the LSC, atmosfair invited the local stakeholders together with Sapient to provide comments on the proposed CDM PoA. The invitation letter which was sent to the stakeholders, names both atmosfair and Sapient as inviting parties. We consider this as according to PS-PoA ver. 02 paragraph 51, since it is not stated that the CME alone needs to invite stakeholders. The invitation letter was provided to the DOE. atmosfair as CME, according to PS-PoA ver. 02 paragraph 51 further had to "demonstrate how due steps were taken to appropriately engage stakeholders and solicit comments" and considered it as most appropriate that the local announcements for the upcoming physical stakeholder consultation meeting on 12.08.2018 were done by the local partner Sapient in the local language. Therefore, we consider the project in line with PS-PoA ver. 02 paragraph 51.

The Nature Club of Rajasthan took over the project coordination as CME only after the local stakeholder consultation. An according written agreement was signed on 09.09.2018. The agreement was provided to the DOE. The Nature Club of Rajasthan applied for the LoA, thus meeting the meeting the local host country DNA requirement, that a local entity from India needs to be CME of a project and apply for the LoA. The LoA was issued to the Nature Club of Rajasthan on 15.04.2019.

The Nature Club of Rajasthan supported the procedure, that atmosfair and Sapient solicited stakeholder comments. This is proven by the fact that they handed in the Local Stakeholder Report to the Indian DNA when applying for the LoA and that they signed the inclusion form for the CPA inclusion.

The Indian DNA also reviewed and approved the Local Stakeholder Report before they issued the LoA for the Nature Club of Rajasthan on 15.04.2019.

During validation the validating DOE interviewed the CME representative Mr. Hitesh Goyal on 06.09.2019 in the CME Office in Jaipur regarding the Local Stakeholder Consultation processes and confirmed in the validation report that the CME supports and approved the LSC process for CPA inclusions.

During verification the DOE interviewed the CME representative Mr. Hitesh Goyal on 30.04.2021 and the CME approved the project implementation and operation.

Documentation provided by the CME	
Revised MR and ER spread sheet	
DOE assessment	Date: 23/08/2021
<p>1: <u>Verification team has reviewed the agreement between the CME and PP, wherein the PP is authorized to co-ordinate with the DOE for validation and verification process and also for the preparation of project documents for CME. The agreement is referred as item number /10-i/ in Appendix 3 and was reviewed during the course of verification. Verification team had further confirmed this by interviewing Mr Hitesh Goyal (CME representative: please refer section D.3 of this report).</u></p> <p><u>Based on above assessment, verification team confirms that the Monitoring report was prepared and submitted by the CME (via the PP i.e. atmosfair gGmbH as per contractual arrangement assessed above) and thus complied with requirements of paragraph 208 of PCP-PoA ver. 02. Upon receipt of the MR from CME, the DOE has made it make public and thus complied with requirements of (b) paragraph 296 of VVS-PoA ver. 01 via the PP (atmosfair gGmbH).</u></p> <p>2: <u>For the monitoring parameter "$B_{y=1, new, i, j, survey}$", the applied monitoring methodology AMS-II.G, version 10 states the measurement procedures as "Sample surveys to estimate this parameter, that are solely based on questionnaires or interviews (i.e. that do not implement measurement campaigns) may only be used if the following conditions are satisfied.</u></p> <p><u>Pre-project devices have been completely decommissioned and only efficient project device(s) are exclusively used in the project households; If multiple devices are used in the project, it is possible from the results of the survey questions to clearly differentiate the quantity of woody biomass being used by each device. In other words, if more than one device, or another device that consumes woody biomass, are in use in project households, then the sample survey needs to distinguish the quantity of biomass used by the project device and the other devices that use biomass"</u></p> <p><u>The verification team confirms that the stated parameter was not solely based on questionnaires or interviews. It is calculated using two factors: "fillings_y" (determined through interviews) and "load_y" (directly measured for the project stoves while conducting WBTs). Furthermore, during the monitoring surveys, it was confirmed by the monitoring team that each of the households have completely decommissioned the pre-project devices and are exclusively using only the project stoves. This could further be confirmed by the verification team during the remote audit interviews with the sampled end users as a part of acceptance sampling. Hence the DOE deemed the monitoring of the parameter in line with the applied methodology and the registered PoA-DD.</u></p> <p>3: <u>As required by the applied methodology AMS-III.B.G, version 03, the value of the monitored parameter "$NCV_{charcoal, i}$", determined by an independent third party laboratory, has been cross checked with IPCC default value. The verification team confirms that the monitored value is deemed acceptable within the IPCC default value range. Revised Monitoring and Verification report being submitted in this respect.</u></p> <p>4: <u>As per the approved and revised CPA-DD, the charcoal quantity is to be cross checked with:</u></p> <ul style="list-style-type: none"> - <u>Total quantity of charcoal generated by the project stoves based on the monitored fuelwood consumption along with observed conversion rate of the fuel to charcoal</u> - <u>The average amount of charcoal collected from the stove users based on records of FAs collecting charcoal</u> <p><u>The verification team has cross checked the amount of charcoal produced by the project activity using the above two methods as explained below:</u></p> <p><u>As calculated and shown in the ER spread sheet, the monitored fuelwood consumption during the monitoring period is 1.64 tonne/stove/annum (please refer cell C56 in the sheet "Survey results" of the ER spread sheet). During the WBTs for the monitoring period, charcoal conversion rate was also measured which was 21.78%. Hence the charcoal produced using this calculation is 0.36 tonne/stove/ annum (=1.64 t/a * 21.78%). Now the –amount of charcoal collected from stove users based on records of FAs collecting charcoal is 0.3310 tonne/stove/annum (please refer to cell D38 of the sheet "charcoal data" in the ER spread sheet) again which is very close to the charcoal sold during the monitoring period, 0.3308 tonne/stove/annum (please refer to cell D39 of the sheet "charcoal data" in the ER spread sheet). The verification team has cross checked all the calculations including the data source in the ER spread sheet and found to be correct.</u></p> <p><u>Furthermore, verification team based on following confirms, that that no charcoal was supplied from other</u></p>	

sources other than the PoA devices and that the records from the collection agents only reflect charcoal from the PoA devices:

- ✓ -review of the charcoal collection records /19/.
- ✓ charcoal sales records /19/.
- ✓ Field Assistants records (separately maintained for the PoA 10516 and 10292 including mutually exclusive FAs appointed for the two PoAs /20/).
- ✓ interviews with the CME representative, PP representative, Sapient Infotech and Field Assistants. ~~the verification team~~ confirms that the charcoal collection, storage and selling for the two stated PoAs are maintained separately without any chance of intermixing.

5: During the course of verification, verification team has reviewed the CPA--DD of CPA 1 and also the corresponding validation report. Please refer the following excerpt of validation report (refer page 31 of 61) on the LSC:

"As per PoA-DD and CPA-DD/2/, it would be demonstrated at the CPA level. The validation team has reviewed the LSC report/16/ for the CPA1. The project is being developed in Gold Standard as well. CME has sent public notice to identified local stakeholders on 30th July 2018 and 31st July 2018. Invitations were mainly distributed per invitation e- mail which is the common way of informing about meetings in India..... car announcement by Sapient driving around and announcing the meeting. Through such public announcements a broad range of stakeholders could be reached, regardless of gender age and ethnicity or level of education".

Based on above, verification team confirms the requirements of paragraph 51 of the PS-PoA, version 02. This is also in compliance with the of paragraph 294 of VVS-PoA, version 02.

Table 4. FARs from this verification

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

Appendix 5 Data and parameters fixed ex ante

Parameter	Net calorific value of the non-renewable woody biomass that is substituted (NCV_{wood} or $NCV_{biomass}$)
Data unit:	TJ/tonne
Default values used:	0.0156
Purpose of data	Baseline emissions calculation
Source and Verification of the source	The value of this parameter is fixed ex-ante /15/.

Parameter	Default net calorific value of charcoal ($NCV_{charcoal,default}$)
Data unit:	GJ/tonne
Default values used:	29.5
Purpose of data	Baseline emissions calculation
Source and Verification of the source	The value of this parameter is fixed ex-ante /15/.

Parameter	Fraction of woody biomass saved by the project activity in period y that can be established as non-renewable biomass ($f_{NRB,y}$)
Data unit:	Percentage
Default values used:	87.18% (value for West Bengal)
Purpose of data	Baseline emissions calculation
Source and Verification of the source	The value of this parameter is fixed ex-ante /15/.

Parameter	Emission factor for the fossil fuels projected to be used for substitution of non-renewable woody biomass by similar consumers ($EF_{projected_fossilfuel}$)
Data unit:	TJ/tonne
Default values used:	63.7
Purpose of data	Baseline emissions calculation
Source and Verification of the source	The value of this parameter is fixed ex-ante /15/.

Parameter	Leakage adjustment factor period y (L_y)
Data unit:	Fraction
Default values used:	0.95
Purpose of data	Baseline emissions calculation
Source and Verification of the source	The value of this parameter is fixed ex-ante /15/.

Parameter	Conversion factor fuelwood to conventional charcoal (CF)
Data unit:	-
Default values used:	6
Purpose of data	Baseline emissions calculation
Source and Verification of the source	The value of this parameter is fixed ex-ante /15/.

Parameter	Global warming potential of methane (GWP_{CH_4})
Data unit:	t CO ₂ e/t CH ₄
Default values used:	25
Purpose of data	Baseline emissions calculation
Source and Verification of the source	The value of this parameter is fixed ex-ante /15/.

Parameter	Specific methane generation for the baseline charcoal generation process in the year y ($SMG_{y,b}$)
Data unit:	t CO ₂ e/t CH ₄
Default values used:	0.030
Purpose of data	Baseline emissions calculation
Source and Verification of the source	The value of this parameter is fixed ex-ante /15/.

Parameter	Factor to account for any legal requirement for capture and destruction of methane in the charcoal production facility
-----------	--

	(M _d)
Data unit:	t CH ₄ /t
Default values used:	0
Purpose of data	Baseline emissions calculation
Source and Verification of the source	The value of this parameter is fixed ex-ante /15/.

Appendix 6 Data and parameters monitored

Monitoring Parameter Requirement	Assessment/ Observation by the DOE														
Data / Parameter: (as in monitoring plan of CPA-DD):	Quantity of woody biomass used by project devices in tonnes per project device ($B_{y=1,new,survey}$)														
Measuring frequency/Time Interval:	Annual														
Reporting frequency:	Annual														
Reported value:	1.64 tonnes wood/year														
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes														
Details of monitoring equipment:	<p>This parameter value is calculated as below: $B_{y=1,new,survey} = fillings_{y=1} * load_{y=1} * 0.052$ (conversion factor to from kg /week to t/a) $fillings_{y=1}$, was determined using the questionnaires and no monitoring equipment was used. $load_{y=1}$, the average weight of a TLUD fuelwood load was determined by applying the average value obtained over all WBTs conducted to determine $\eta_{new,j}$. This parameter was determined using a weighing balance during sampling.</p> <table border="1"> <thead> <tr> <th colspan="2">Weigh Balance</th></tr> </thead> <tbody> <tr> <td>Type/Name</td><td>Simandar Technology/ Shri Sai</td></tr> <tr> <td>Accuracy class</td><td>+/- 0.5 gm</td></tr> <tr> <td>Serial number</td><td>3330</td></tr> <tr> <td>Calibrating agency</td><td>Nutech Calibrators & Engineers</td></tr> <tr> <td>Calibration date</td><td>21/01/2021 (although the calibration date is beyond the monitoring end date of 31/12/2020, but monitoring of this parameter using this equipment was done in March 2021)</td></tr> <tr> <td>Validity of calibration</td><td>20/01/2022</td></tr> </tbody> </table>	Weigh Balance		Type/Name	Simandar Technology/ Shri Sai	Accuracy class	+/- 0.5 gm	Serial number	3330	Calibrating agency	Nutech Calibrators & Engineers	Calibration date	21/01/2021 (although the calibration date is beyond the monitoring end date of 31/12/2020, but monitoring of this parameter using this equipment was done in March 2021)	Validity of calibration	20/01/2022
Weigh Balance															
Type/Name	Simandar Technology/ Shri Sai														
Accuracy class	+/- 0.5 gm														
Serial number	3330														
Calibrating agency	Nutech Calibrators & Engineers														
Calibration date	21/01/2021 (although the calibration date is beyond the monitoring end date of 31/12/2020, but monitoring of this parameter using this equipment was done in March 2021)														
Validity of calibration	20/01/2022														
Is accuracy of the monitoring equipment as stated in the CPA-DD? If the CPA-DD does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practise?	No accuracy of equipment is not stated in the CPA-DD. The monitoring equipment represent good monitoring practise as the equipment is calibrated by the PP.														
Calibration frequency /interval: Is it monitoring methodology /CDM EB guidance / local or national standards / manufacturers specification	The equipment used has valid calibration certificate for the monitoring period.														
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	The calibration interval has not been provided in the CPA-DD. However, the selected frequency represent good monitoring practise.														

represent good monitoring practise?	
Company performing the calibration (internal or external calibration):	External. The weighing balance has been calibrated by Nutech calibrators and engineers.
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	Yes
Is (are) calibration(s) valid for the whole reporting period?	Yes
If applicable, has the reported data been cross-checked with other available data?	Yes, the reported data in MR has been compared with monitoring survey records /5/ and the ER sheet /4/.
How were the values in the monitoring report verified?	The values in the monitoring report /2/ were compared against the values in ER sheet /4/ and the survey records /5/. The values obtained by the PP through sampling were compared with the DOE's sampling during the remote interviews. The results of the sampling have been assessed in the section D.4 and E.3.4.3 of this report.
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. <u>The verification team confirms that this parameter was not solely based on questionnaires or interviews. It is calculated using two factors: "fillingsy" (determined through interviews) and "loady" (directly measured for the project stoves while conducting WBTs). Furthermore, during the monitoring surveys, it was confirmed by the monitoring team that each of the households have completely decommissioned the pre-project devices and are exclusively using only the project stoves. This could further be confirmed by the verification team during the remote audit interviews with the sampled end users as a part of acceptance sampling. Hence the DOE deemed the monitoring of the parameter in line with the applied methodology and the registered PoA-DD.</u>
In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	NA

Monitoring Parameter Requirement	Assessment/ Observation by the DOE
Data / Parameter: (as in monitoring plan of CPA-DD):	Efficiency of the baseline system being replaced (η_{old})
Measuring frequency/Time Interval:	Fixed for each individual household when included in the project activity database
Reporting frequency:	Fixed for each individual household when included in the project activity database
Reported value:	0.10
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
Details of monitoring equipment:	According to AMS II.G, ver. 10, Table 17, a default value of 0.10 can be used, if the "pre-project device, which is a three stone fire using firewood (not charcoal), or a conventional device with no improved

	combustion air supply or flue gas ventilation, that is without a grate or a chimney". In the end user agreement the type of baseline stove used by each of the households is captured which is traditional fire wood stove in all the cases. This was further confirmed during the baseline surveys which could be confirmed by the verification team during the remote interviews.
Is accuracy of the monitoring equipment as stated in the CPA-DD? If the CPA-DD does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practise?	NA
Calibration frequency /interval: Is it monitoring methodology /CDM EB guidance / local or national standards / manufacturers specification	NA
Is the calibration interval in line with the monitoring plan of the CPA-DD? If the CPA-DD does not specify the frequency of calibration, does the selected frequency represent good monitoring practise?	NA
Company performing the calibration (internal or external calibration):	NA
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	NA
Is (are) calibration(s) valid for the whole reporting period?	NA
If applicable, has the reported data been cross-checked with other available data?	Yes, the reported data in MR has been compared with end user agreements / sales receipts /8/, monitoring survey records /5/ and the ER sheet /4/.
How were the values in the monitoring report verified?	The values in the monitoring report /2/ were compared against the values in ER sheet /4/, the survey records /5/ and end user agreements / sales receipts /8/.
Does the data management (from data generation to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the data management ensures correct transfer of data and reporting of emission reductions and all necessary QA/QC processes are in place.
In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	NA

Monitoring Parameter Requirement	Assessment/ Observation by the DOE
Data / Parameter: (as in monitoring plan of CPA-DD):	Efficiency of the device of each type <i>i</i> and batch <i>j</i> implemented as part of the project activity. calculated without accounting for the remaining charcoal ($\eta_{new,j}$)
Measuring frequency/Time Interval:	Annually
Reporting frequency:	Annually
Reported value:	27.13%
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
Details of monitoring equipment:	The stove efficiency testing has been determined by WBTs conducted in line with the guidance provided by the

	<p>CME in the CPA-DD . The monitoring equipment used for conducting the stove efficiencies by WBTs are thermometer, weigh balance and moisture meter. Moisture meter is a self calibrating type as confirmed in its manual. Calibration details of the weigh balance and thermometer are provided below:</p> <table border="1"> <tr> <td></td><td><u>Thermometer</u></td></tr> <tr> <td>Type/Name</td><td>Digital Thermometer Elanco</td></tr> <tr> <td>Accuracy class</td><td>0.01°C, Temperature range - 50° C - +200° C</td></tr> <tr> <td>Serial number</td><td>T18978</td></tr> <tr> <td>Calibrating agency</td><td>Nutech Calibrators & Engineers</td></tr> <tr> <td>Calibration date</td><td>11/12/2020</td></tr> <tr> <td>Validity of calibration</td><td>10/12/2021</td></tr> </table> <table border="1"> <tr> <td></td><td><u>Weigh Balance</u></td></tr> <tr> <td>Type/Name</td><td>Simandar Technology/ Shri Sai</td></tr> <tr> <td>Accuracy class</td><td>+/- 0.5 g</td></tr> <tr> <td>Serial number</td><td>3330</td></tr> <tr> <td>Calibrating agency</td><td>Nutech Calibrators & Engineers</td></tr> <tr> <td>Calibration date</td><td>21/01/2021 (although the calibration date is beyond the monitoring end date of 31/12/2020, but monitoring of this parameter using this equipment was done in March 2021)</td></tr> <tr> <td>Validity of calibration</td><td>20/01/2022</td></tr> </table>		<u>Thermometer</u>	Type/Name	Digital Thermometer Elanco	Accuracy class	0.01°C, Temperature range - 50° C - +200° C	Serial number	T18978	Calibrating agency	Nutech Calibrators & Engineers	Calibration date	11/12/2020	Validity of calibration	10/12/2021		<u>Weigh Balance</u>	Type/Name	Simandar Technology/ Shri Sai	Accuracy class	+/- 0.5 g	Serial number	3330	Calibrating agency	Nutech Calibrators & Engineers	Calibration date	21/01/2021 (although the calibration date is beyond the monitoring end date of 31/12/2020, but monitoring of this parameter using this equipment was done in March 2021)	Validity of calibration	20/01/2022
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Calibration date	21/01/2021 (although the calibration date is beyond the monitoring end date of 31/12/2020, but monitoring of this parameter using this equipment was done in March 2021)																												
Validity of calibration	20/01/2022																												
Is accuracy of the monitoring equipment as stated in the CPA-DD? If the CPA-DD does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practise?	CPA-DD does not specify the accuracy of the monitoring equipment. Verification team confirms that the accuracy of the monitoring equipment used represent good monitoring practice based on sectoral expertise.																												
Calibration frequency /interval: Is it monitoring methodology /CDM EB guidance / local or national standards / manufacturers specification	The equipment used has valid calibration certificate for the monitoring period.																												
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?	The calibration interval has not been provided in the CPA-DD. However, since the equipment is calibrated prior to use the selected frequency represent good monitoring practise.																												
Company performing the calibration(internal or external calibration):	External.																												
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	Yes, the calibration confirmed proper functioning of the monitoring equipment.																												
Is (are) calibration(s) valid for the whole reporting period?	Yes, the calibration is valid for the whole monitoring period.																												
If applicable, has the reported data been cross-checked with other available data?	Yes, the value of parameter has been crosschecked with the raw data sheets for the WBTs and calculation sheets /11/, ER sheet /4/ and the personnel were interviewed																												

	during the OSV.
How were the values in the monitoring report verified?	The reported data has been cross-checked against the raw data sheets for the WBTs and calculation sheets /11/ and compared with the ER sheet /4/ and the MR /2/.
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. As the monitoring parameter under consideration is determined by standardized test procedures (WBT), the QA/QC and calibrations are at the test conduction by the measuring team for WBT. Accordingly, the verification team has focused on abilities, qualifications and recognition of involved personnel and institutions of the measuring team involved in the WBT. The WBT has been carried out by the well-trained personnel and training certificate of the personnel has been provided to the verification team in this respect /9/. The training content /9/ has also been provided to the verification team. The verification team based on remote interviews and review of competency documents and training records /9/ confirms that the team was qualified to carry out the WBT in line with the protocol.
In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	NA

Monitoring Parameter Requirement	Assessment/ Observation by the DOE
Data / Parameter: (as in monitoring plan of CPA-DD):	Adjusted total number of ICS of batch j operating during year y ($N_{y,j}$)
Measuring frequency/Time Interval:	annual
Reporting frequency:	Yearly
Reported value:	23,405
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
Details of monitoring equipment:	No monitoring equipment is used. The parameter is calculated based on the stoves sales database /6/.
Is accuracy of the monitoring equipment as stated in the CPA-DD? If the CPA-DD does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practise?	An electronic sales database has been maintained for the project activity
Calibration frequency /interval: Is it monitoring methodology /CDM EB guidance / local or national standards / manufacturers specification	NA
Is the calibration interval in line with the monitoring plan of the CPA-DD? If the CPA-DD does not specify the frequency of calibration, does the selected frequency represent good monitoring practise?	NA.
Company performing the calibration(internal or external calibration):	NA
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	NA
Is (are) calibration(s) valid for the whole reporting period?	NA

If applicable, has the reported data been cross-checked with other available data?	Yes, reported data in MR /2/ has been compared with ER sheet /4/ and the sales database /6/.
How were the values in the monitoring report verified?	The values in the monitoring report /2/ were compared against the values in ER sheet /4/ and the sales database /6/.
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 data collection has been done by the trained individuals /12/ working with the PP and the transfer of data and reporting of emission reductions has been done by the personnel from the project participant, atmosfair gGmbH, project participant involved in multiple PoAs under CDM /B05-1/.
In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	NA

Monitoring Parameter Requirement	Assessment/ Observation by the DOE
Data / Parameter: (as in monitoring plan of CPA-DD):	Statistically adjusted drop out from total population of ICS in period y ($DO_{II,G,y}$)
Measuring frequency/Time Interval:	Annual
Reporting frequency:	Annual
Reported value:	0
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
Details of monitoring equipment:	NA. Data is collected through sampling questionnaires.
Is accuracy of the monitoring equipment as stated in the CPA-DD? If the CPA-DD does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practise?	NA
Calibration frequency /interval: Is it monitoring methodology /CDM EB guidance / local or national standards / manufacturers specification	NA
Is the calibration interval in line with the monitoring plan of the CPA-DD? If the CPA-DD does not specify the frequency of calibration, does the selected frequency represent good monitoring practise?	NA
Company performing the calibration(internal or external calibration):	NA
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	NA
Is (are) calibration(s) valid for the whole reporting period?	NA
If applicable, has the reported data been cross-checked with other available data?	Yes, the value of parameter has been crosschecked with the sales database /5/, ER sheet /4/ and sample household questionnaires /5/ and the scanned hard copy records were also checked during the remote interviews.
How were the values in the monitoring report verified?	The reported data has been cross-checked against the questionnaire answers /5/, records in the ER sheet /4/ and compared with the MR /2/.

	The data was then verified against the sample households checked during the remote interviews .
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 process are in place. The data collection has been done by the trained individuals /9/ working with the PP and the transfer of data and reporting of emission reductions has been done by the personnel from the project participant, atmosfair gGmbH, project participant involved in multiple PoAs under CDM /B05-1/
In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	NA.

Monitoring Parameter Requirement	Assessment/ Observation by the DOE																												
Data / Parameter: (as in monitoring plan of PDD):	$Q_{CCP,y}$ Produced quantity of charcoal in year y																												
Measuring frequency/Time Interval:	Continuously at the time of delivery to charcoal buyers or retailers																												
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes																												
Reported value:	7,743.21 tonnes																												
Details of monitoring equipment:	<p>This parameter was monitored using weighing balances.</p> <table border="1"> <thead> <tr> <th colspan="2"><u>Weigh Balance (Deganga)</u></th></tr> </thead> <tbody> <tr> <td>Type/Name</td><td>AMI</td></tr> <tr> <td>Accuracy class</td><td>Class III</td></tr> <tr> <td>Serial number</td><td>60750201</td></tr> <tr> <td>Calibrating agency</td><td>Nutech calibrators and engineers</td></tr> <tr> <td>Calibration date</td><td>05/02/2020</td></tr> <tr> <td>Validity of calibration</td><td>05/02/2021</td></tr> </tbody> </table> <table border="1"> <thead> <tr> <th colspan="2"><u>Weigh Balance (Uluberia)</u></th></tr> </thead> <tbody> <tr> <td>Type/Name</td><td>B.M. Group, Model BMP III</td></tr> <tr> <td>Accuracy class</td><td>Class III</td></tr> <tr> <td>Serial number</td><td>1625</td></tr> <tr> <td>Calibrating agency</td><td>Nutech calibrators and engineers</td></tr> <tr> <td>Calibration date</td><td>24/02/2020</td></tr> <tr> <td>Validity of calibration</td><td>24/02/2021</td></tr> </tbody> </table>	<u>Weigh Balance (Deganga)</u>		Type/Name	AMI	Accuracy class	Class III	Serial number	60750201	Calibrating agency	Nutech calibrators and engineers	Calibration date	05/02/2020	Validity of calibration	05/02/2021	<u>Weigh Balance (Uluberia)</u>		Type/Name	B.M. Group, Model BMP III	Accuracy class	Class III	Serial number	1625	Calibrating agency	Nutech calibrators and engineers	Calibration date	24/02/2020	Validity of calibration	24/02/2021
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	Weigh Balance (Purba Medinipur)														
Type/Name	Silver Eagle, MMH-PF														
Accuracy class	Class III														
Serial number	E 16429														
Calibrating agency	Controller of Legal Metrology														
Calibration date	03/07/2020														
Validity of calibration	02/07/2021														
Is accuracy of the monitoring equipment as stated in the PDD? If the PDD does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practise?	No accuracy of equipment is not stated in the CPA-DD. The monitoring equipment represent good monitoring practise as the equipment is calibrated by the PP.														
Calibration frequency /interval: Is it monitoring methodology /CDM EB guidance / local or national standards / manufacturers specification	The equipment used has valid calibration certificate for the monitoring period.														
Is the calibration interval in line with the monitoring plan of the PDD? If the PDD does not specify the frequency of calibration, does the selected frequency represent good monitoring practise?	The calibration interval has not been provided in the CPA-DD. However, the selected frequency represent good monitoring practise.														
Company performing the calibration (internal or external calibration):	External Calibration. Weighing balance has been calibrated by Legal Metrology Department, Government of West Bengal, India.														
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	Yes, the calibration confirmed proper functioning of the monitoring equipment.														
Is (are) calibration(s) valid for the whole reporting period?	Yes, the calibration is valid for the whole monitoring period.														
If applicable, has the reported data been cross-checked with other available data?	<p>The value of the parameter has been cross-checked with the total quantity of charcoal generated by the micro gasifiers based on monitored fuelwood consumption and the observed conversion-rate to charcoal. The monitored value of fuelwood consumption per stove is 1.64 tonnes/stove/year. The observed conversion-rate from wood to charcoal from the WBTs conduct is 4.443 kg of wood gives 1 kg charcoal resulting is 0.39 tonnes of charcoal / stove / year (=1.64/4.443). The average amounts of charcoal collected from stove users based on records of field assistant collecting charcoal is 0.33 tonnes/stove/year which is less than the value based on monitored fuelwood consumption and the observed conversion-rate (the difference in the value may be due to the losses during charcoal handling / transport).</p> <p>The cross check has been performed in accordance with the CPA-DD and the values are deemed acceptable to the verification team.</p>														
How were the values in the monitoring report verified?	The values in the monitoring report were verified through the review of the collection records and the retailer sales records /19/ and the values are comparable, as demonstrated in the ER sheet /4/.														
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 process are in place.</p> <p><u>As per the approved and revised CPA-DD, the</u></p>														

	<p><u>charcoal quantity is to be cross checked with:</u></p> <ul style="list-style-type: none"> - <u>Total quantity of charcoal generated by the project stoves based on the monitored fuelwood consumption along with observed conversion rate of the fuel to charcoal</u> - <u>The average amount of charcoal collected from the stove users based on records of FAs collecting charcoal</u> <p><u>The verification team has cross checked the amount of charcoal produced by the project activity using the above two methods as explained below:</u></p> <p><u>As calculated and shown in the ER spread sheet, the monitored fuelwood consumption during the monitoring period is 1.64 tonne/stove/annum (please refer cell C56 in the sheet "Survey results" of the ER spread sheet). During the WBTs for the monitoring period, charcoal conversion rate was also measured which was 21.78%. Hence the charcoal produced using this calculation is 0.36 tonne/stove/ annum (=1.64 t/a * 21.78%). Now the amount of charcoal collected from stove users based on records of FAs collecting charcoal is 0.3310 tonne/stove/annum (please refer to cell D38 of the sheet "charcoal data" in the ER spread sheet) again which is very close to the charcoal sold during the monitoring period, 0.3308 tonne/stove/annum (please refer to cell D39 of the sheet "charcoal data" in the ER spread sheet). The verification team has cross checked all the calculations including the data source in the ER spread sheet and found to be correct.</u></p> <p><u>Furthermore, verification team based on following confirms, that that no charcoal was supplied from other sources other than the PoA devices and that the records from the collection agents only reflect charcoal from the PoA devices:</u></p> <ul style="list-style-type: none"> ✓ <u>review of the charcoal collection records /19/.</u> ✓ <u>charcoal sales records /19/.</u> ✓ <u>Field Assistants records (separately maintained for the PoA 10516 and 10292 including mutually exclusive FAs appointed for the two PoAs /20/).</u> ✓ <u>interviews with the CME representative, PP representative, Sapient Infotech and Field Assistants, confirms that the charcoal collection, storage and selling for the two stated PoAs are maintained separately without any chance of intermixing.</u>
<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?</p>	<p>NA. Full data is available for the monitoring period.</p>

Monitoring Parameter Requirement	Assessment/ Observation by the DOE
Data / Parameter: (as in monitoring plan of CPA-DD):	Net calorific value of charcoal type i generated in ICSs in the project activity (NCV _{charcoal})
Measuring frequency/Time Interval:	Monitored once during the first year of the crediting period.
Reporting frequency:	Once during the first year of the crediting period.
Reported value:	28.58 GJ/tonne
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
Details of monitoring equipment:	The value is provided by an independent accredited laboratory (ESKAPS India Pvt. Ltd.) /17/
Is accuracy of the monitoring equipment as stated in the CPA-DD? If the CPA-DD does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practise?	NA
Calibration frequency /interval: Is it monitoring methodology /CDM EB guidance / local or national standards / manufacturers specification	NA
Is the calibration interval in line with the monitoring plan of the CPA-DD? If the CPA-DD does not specify the frequency of calibration, does the selected frequency represent good monitoring practise?	NA
Company performing the calibration(internal or external calibration):	NA
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	NA
Is (are) calibration(s) valid for the whole reporting period?	NA
If applicable, has the reported data been cross-checked with other available data?	Yes, the value of parameter has been crosschecked with report from an independent accredited laboratory (ESKAPS India Pvt. Ltd.) /17/
How were the values in the monitoring report verified?	The value of parameter has been crosschecked with report from an independent accredited laboratory (ESKAPS India Pvt. Ltd.) /17/
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?	The value of parameter has been measured by an independent accredited laboratory (ESKAPS India Pvt. Ltd.) /17/. <u>As required by the applied methodology AMS-III.B.G, version 03, the value of the monitored parameter "NCV_{charcoal,i}", determined by an independent third party laboratory, has been cross checked with IPCC default value. The verification team confirms that the monitored value is deemed acceptable within the IPCC default value range. Revised Monitoring and Verification report being submitted in this respect.</u>
In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	NA.

Monitoring Parameter Requirement	Assessment/ Observation by the DOE
Data / Parameter: (as in monitoring plan of CPA-DD):	The operating life time of the project device (Life Span)
Measuring frequency/Time Interval:	Fixed and recorded at the time of commissioning
Reporting frequency:	Fixed and recorded at the time of commissioning
Reported value:	7 years
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
Details of monitoring equipment:	NA
Is accuracy of the monitoring equipment as stated in the CPA-DD? If the CPA-DD does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practise?	NA
Calibration frequency /interval: Is it monitoring methodology /CDM EB guidance / local or national standards / manufacturers specification	NA
Is the calibration interval in line with the monitoring plan of the CPA-DD? If the CPA-DD does not specify the frequency of calibration, does the selected frequency represent good monitoring practise?	NA
Company performing the calibration(internal or external calibration):	NA
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	NA
Is (are) calibration(s) valid for the whole reporting period?	NA
If applicable, has the reported data been cross-checked with other available data?	Yes, the reported value is cross checked with the manufacturer's specification /7/
How were the values in the monitoring report verified?	The reported value is cross checked with the manufacturer's specification /7/
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?	The reported value is cross checked with the manufacturer's specification /7/
In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	NA.

Monitoring Parameter Requirement	Assessment/ Observation by the DOE
Data / Parameter: (as in monitoring plan of CPA-DD):	Actual date of commissioning of the project device (Date of commissioning of project device i)
Measuring frequency/Time Interval:	Fixed and recorded at the time of commissioning /distribution
Reporting frequency:	Fixed and recorded at the time of commissioning /distribution
Reported value:	Several dates starting from 10/09/2018 /6/
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
Details of monitoring equipment:	No monitoring equipment is used.
Is accuracy of the monitoring equipment as stated in the CPA-DD? If the CPA-DD does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practise?	NA
Calibration frequency /interval: Is it monitoring methodology /CDM EB guidance / local or national standards / manufacturers specification	NA
Is the calibration interval in line with the monitoring plan of the CPA-DD? If the CPA-DD does not specify the frequency of calibration, does the selected frequency represent good monitoring practise?	NA.
Company performing the calibration(internal or external calibration):	NA
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	NA
Is (are) calibration(s) valid for the whole reporting period?	NA
If applicable, has the reported data been cross-checked with other available data?	Yes, reported data has been compared with ER sheet /4/ and the sales database /6/.
How were the values in the monitoring report verified?	Yes, reported data has been compared with ER sheet /4/ and the sales database /6/.
Does the data management (from data generation to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the data management ensures correct transfer of data and reporting of emission reductions and all necessary QA/QC processes are in place.
In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	NA

Monitoring Parameter Requirement	Assessment/ Observation by the DOE
Data / Parameter: (as in monitoring plan of CPA-DD):	Number of project devices distributed per household ($N_{d,HH}$)
Measuring frequency/Time Interval:	Fixed and recorded at the time of commissioning /distribution
Reporting frequency:	Fixed and recorded at the time of commissioning /distribution
Reported value:	1
Is measuring and reporting frequency in accordance with the monitoring plan and	Yes

monitoring methodology? (Yes / No)	
Details of monitoring equipment:	No monitoring equipment is used. The parameter is calculated based on the stoves sales database /6/.
Is accuracy of the monitoring equipment as stated in the CPA-DD? If the CPA-DD does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practise?	NA
Calibration frequency /interval: Is it monitoring methodology /CDM EB guidance / local or national standards / manufacturers specification	NA
Is the calibration interval in line with the monitoring plan of the CPA-DD? If the CPA-DD does not specify the frequency of calibration, does the selected frequency represent good monitoring practise?	NA.
Company performing the calibration(internal or external calibration):	NA
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	NA
Is (are) calibration(s) valid for the whole reporting period?	NA
If applicable, has the reported data been cross-checked with other available data?	Yes, reported data in MR /2/ has been compared with ER sheet /4/ and the sales database /6/.
How were the values in the monitoring report verified?	The values in the monitoring report /2/ were compared against the values in ER sheet /4/ and the sales database /6/.
Does the data management (from data generation to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the data management ensures correct transfer of data and reporting of emission reductions and all necessary QA/QC processes are in place.
In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	NA

Appendix 7. Assessment of Monitoring parameters monitored through sampling/surveys

Sl. No.	Checklist Questions	Assessment															
1.	Does the Monitoring Report apply sampling for determination of ex-post monitoring parameters?	Yes, there are ex-post monitoring parameters determined through the sampling effort.															
2.	Is the applied sampling plan in accordance with the sampling plan proposed in the registered PoA-DD/ PDD?	Yes, the applied sampling plan is in accordance with the sampling plan proposed in the registered PoA-DD / CPA-DD.															
3.	<p>List the parameters determined through sampling and respective parameters of interest.</p> <p>In situations where the monitoring of a parameter is based on data, which is being recorded only once at the time of implementation/distribution particularly for distribution projects, where there are large/dispersed number of project technology, the VV team shall assess the accuracy of such data/information during the onsite verification through document review and where applicable through acceptance sampling.</p> <p>The assessment of implementation status of distribution projects or projects having dispersed and large number of components, it is pertinent that the VV Team shall assess that all physical features (technology, project equipment, and monitoring and metering equipment) of the included CPAs/projects are as specified in the included CPA-DDs/PDD. In cases where the households/users are no longer using the project technology or have voluntarily left the project, it is important for VT to assess CME/PP's QA/QC procedures with regards to handling of its database and where applicable consider those dropped out from technology as a part of assessment of sampling requirements, including acceptance sampling by DOE.</p>	<p>Parameters determined through sampling and respective parameters of interest are:</p> <table> <tr> <th>Parameter</th><th>Description of Parameter</th><th>Parameter of Interest</th></tr> <tr> <td>$DO_{II,G,y}$</td><td>Statistically adjusted drop out from total population of ICS in period y</td><td>Proportion</td></tr> <tr> <td>$fillings_{y=1}$</td><td>Average number of weekly fillings of a batch-loaded ICS</td><td>Mean</td></tr> <tr> <td>$load_{y=1}$</td><td>Average amount of fuelwood used per filling of an ICS</td><td>Mean</td></tr> <tr> <td>$\eta_{new,j}$</td><td>Efficiency of the baseline system being replaced</td><td>Mean</td></tr> </table>	Parameter	Description of Parameter	Parameter of Interest	$DO_{II,G,y}$	Statistically adjusted drop out from total population of ICS in period y	Proportion	$fillings_{y=1}$	Average number of weekly fillings of a batch-loaded ICS	Mean	$load_{y=1}$	Average amount of fuelwood used per filling of an ICS	Mean	$\eta_{new,j}$	Efficiency of the baseline system being replaced	Mean
Parameter	Description of Parameter	Parameter of Interest															
$DO_{II,G,y}$	Statistically adjusted drop out from total population of ICS in period y	Proportion															
$fillings_{y=1}$	Average number of weekly fillings of a batch-loaded ICS	Mean															
$load_{y=1}$	Average amount of fuelwood used per filling of an ICS	Mean															
$\eta_{new,j}$	Efficiency of the baseline system being replaced	Mean															
4.	Is the sample size calculated in accordance with the formula presented in the registered PoA-DD/PDD?	Yes, the sample size calculated is in accordance with the formula presented in the PoA-DD/CPA-DD															
5.	<p>Are the assumptions used for calculation of sample size appropriate and correct?</p> <p>P.S.: Provide assessment on appropriateness of value of proportion (p), standard deviation (STDEV) or variance (v) used for calculation of sample size.</p>	<p>Simple Random Sampling was applied for all the parameters for annually monitoring with 95/10 confidence/precision by the CME for selection of the monitoring samples. The same is deemed acceptable as per the PoA-DD/CPA-DD.</p> <p>The proportion (p), standard deviation (STDEV) or variance (v) used for calculation of sample size are found to be appropriate. All assumptions for the calculation of sample size were used by the CME's experience which has been checked by the verification team and deemed acceptable.</p>															

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6.	<p>What are the sample sizes obtained for the parameters being monitored? Is the determined sample size deemed adequate for the parameter of interest being monitored?</p> <p>P.S.: If the sample size calculation returns a value of less than 30 samples, a minimum sample size of 30 shall be chosen when the parameter of interest is a proportion. If the parameter of interest is a numeric mean value (i.e. not a proportion or percentage) the Student's t-distribution shall be used if the resulting sample size is less than 30.</p> <p>While assessing the sampling effort by the PP/CME particularly the sample size, the VV Team shall make sure that the reliability criteria (confidence level and precision) should be as per the requirement of the applied methodology. Only when there is no specific guidance in the applied methodology for the sampling requirements, the confidence/precision as stated in the sampling standards should be considered. As a rule of thumb it is to be always kept in mind that the sampling requirements in the applied methodology shall take precedence.</p>	<p>It was found that for all the parameters, the respective confidence/precision was met. The number of samples for each of the parameters covered during the monitoring activity is as given below:</p> <table><tr><th>Parameters</th><th>$DO_{II,G,y}$</th><th>$fillings_{y=1}$</th><th>$load_{y=1}$</th><th>$\eta_{new,j}$</th></tr><tr><td>Calculated Sample Size</td><td>0</td><td>5</td><td>1</td><td>1</td></tr><tr><td>Applied Sample Size</td><td>30</td><td>30</td><td>9</td><td>9</td></tr><tr><td>Precision achieved</td><td>0%</td><td>4.44%</td><td>0.52%</td><td>0.99%</td></tr></table> <p>For the mean parameters, t-distribution has been used since the resulting sample size was less than 30.</p> <p>As the actual sample size in all the cases was not less than either the calculated sample size or the minimum sample size as per the PoA-DD/CPA-DD, the sample size covered by the CME was accepted.</p>	Parameters	$DO_{II,G,y}$	$fillings_{y=1}$	$load_{y=1}$	$\eta_{new,j}$	Calculated Sample Size	0	5	1	1	Applied Sample Size	30	30	9	9	Precision achieved	0%	4.44%	0.52%	0.99%
Parameters	$DO_{II,G,y}$	$fillings_{y=1}$	$load_{y=1}$	$\eta_{new,j}$																		
Calculated Sample Size	0	5	1	1																		
Applied Sample Size	30	30	9	9																		
Precision achieved	0%	4.44%	0.52%	0.99%																		
7.	<p>Has reliability specification been applied to determine the sampling requirements for each individual parameter value determined through a sampling effort?</p> <p>P.S.: If there is more than one parameter to be estimated in a CDM project activity, then a sample size calculation should be done for each of them. Then either the largest number for the sample size is chosen for the sampling effort with one common survey, or the sampling effort and survey is repeated for each of the parameters. A random sub-sample within the common survey is allowed as long as: (i) the reliability specification (e.g. 90/10 confidence/precision for small-scale CDM project activities and 95/10 for large scale CDM project activities) is achieved for each individual parameter; and (ii) the random sub-sample is consistent with the design of the survey and the corresponding sample size calculation.</p>	<p>Sampling for all the parameters was done with 95/10 confidence/precision. The necessary confidence / precision of 95/10 for all the parameters are met. This has been cross verified by the verification team from the supporting documents submitted /4/. The number of samples for each of the parameters covered during the monitoring activity is provided in the above row.</p> <p>For the mean parameters, Student's t-distribution has been used since the resulting sample size was less than 30.</p>																				
8.	<p>Is the assumed response rate reasonable (appropriate and correct) for the determination of samples to be surveyed?</p>	<p>Yes, the assumed response rate is reasonable (appropriate and correct) for the determination of samples to be surveyed for each of the parameter of interest.</p>																				
9.	<p>Is the sample selected by PP for determination of the monitored parameters unbiased (random) and representative?</p>	<p>Yes, the verification team, based on evidence for random number generator as provided by the CME, confirms that sample selected by the CME for determination of the monitored parameters are random. It can be considered as representative of the population.</p>																				
10.	<p>Has minimum target level of precision been achieved based on estimates from the actual samples?</p>	<p>Yes, the minimum target level of precision been achieved based on estimates from the actual samples.</p>																				

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		<table><tr><td>Parameters</td><td>$DO_{II,G,y}$</td><td>$fillings_{y=1}$</td><td>$load_{y=1}$</td><td>$\eta_{new,j}$</td></tr><tr><td>Required precision</td><td>10%</td><td>10%</td><td>10%</td><td>10%</td></tr><tr><td>Precision achieved</td><td>0%</td><td>4.44%</td><td>0.52%</td><td>0.99%</td></tr></table> <p>This has been checked and confirmed by reviewing Survey database and WBT results provided by the CME.</p>	Parameters	$DO_{II,G,y}$	$fillings_{y=1}$	$load_{y=1}$	$\eta_{new,j}$	Required precision	10%	10%	10%	10%	Precision achieved	0%	4.44%	0.52%	0.99%
Parameters	$DO_{II,G,y}$	$fillings_{y=1}$	$load_{y=1}$	$\eta_{new,j}$													
Required precision	10%	10%	10%	10%													
Precision achieved	0%	4.44%	0.52%	0.99%													
11.	In case the minimum target level of precision has not been achieved based on estimates from the actual samples, please specify the approach adopted by PP to reach the required precision and also justify the appropriateness of the adopted approach in accordance with the applied methodology or paragraph 18 of Sampling and surveys for CDM project activities and programmes of activities (Version 08).	Not applicable since as assessed above the target level of precision has been achieved.															
12.	<p>Has VT applied acceptance sampling to verify that the results of sampling efforts undertaken by PP for determination of ex-post parameters. If yes, please provide a detailed justification of the approach adopted including information on (but not limited to):</p> <ul style="list-style-type: none">(a) Selected AQL Level(b) Selected UQL Level(c) Selected Consumer Risk Level(d) Selected Producer Risk Level(e) Sample Size chosen for acceptance sampling(f) Acceptance number (c) <p>Approach adopted by VT to in case value of greater than c discrepant records were observed in the sample</p>	<p>In line with paragraph 26 of the Sampling Standard, the verification team has applied a sampling approach as part of verification. Now as the CME had applied sampling approach, the verification team has chosen acceptance sampling for the parameters in accordance with paragraph 28 of the sampling standard /B07/.</p> <p>In line with paragraph 26 of the Sampling Standard, the verification team has applied a sampling approach for remote interviews as part of verification. Now as the CME had applied sampling approach, the verification team has chosen acceptance sampling in accordance with paragraph 28 of the sampling standard /B07/.</p> <p>DOE used sampling during verification for checking the reported values for the monitoring parameters to check the operational status, fillings sizes, load sizes and to check if the WBT tests have been done in the households. As per the sampling standard /B07/, DOE had identified 18 samples out of the PP's 30 samples for the parameters $DO_{II,G,y}$, and $fillings_{y=1}$ and confirmed all the 9 samples for the parameters $load_{y=1}$ and $\eta_{new,j}$ based on the AQL/UQL stated below. A sample size of 18 was required, based on an AQL of 1 % and UQL of 20 %, the producer risk used is 10 % and consumer risk used was 10 %. Acceptance number (c) thus determined for the sample is 1. All the identified 18 samples had the same operational status, average load sizes and fillings as reported in the sampling frame of the CME and hence no discrepancy was found (i.e. $c=0$). All the households sampled for the monitoring parameter $\eta_{new,j}$ confirmed that the WBT tests were conducted on the stoves from those households. Thus, PP's set of records has been accepted in line with §32</p>															

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		of the sampling standard (version 08.0) /B07/. Verification team has cross verified these sample documents.
13.	Are the procedures for the selected survey and data collection method unambiguously defined and do they adequately provide for minimizing non-sampling errors?	Verification team based on remote interviews and review of documented procedure confirms that the selected survey and data collection method is unambiguously defined. This also adequately ensure minimizing non-sampling errors.
14.	Have potential sources of bias inherent in the selected data collection method, such as self-selection and under-coverage, been anticipated? Have mechanisms for mitigating these been considered?	Review of sampling records, documented procedure and remote interviews with the personnel conducted WBT/Surveys does not any reveal sources of bias inherent in the selected data collection.
15.	Is the quality control and assurance strategy adequate?	Verification team based on review of provided supporting documents and remote interviews confirms that the quality control and assurance strategy is adequate.
16.	Are the proposed skill sets, qualifications and experience of the personnel/institutions engaged to conduct the standardized tests/data collection exercise adequate?	<p>Monitoring parameters $DO_{ll.G,y}$ and $fillings_{y=1}$ are monitored through monitoring sample surveys. Monitoring parameters $\eta_{new,y}$ and $load_{y=1}$ are monitored through conducting water boiling tests. As the monitoring parameter under consideration (Thermal efficiency of the stoves) is determined by standardized test procedures, the QA/QC and calibrations are at the test conduction by the measuring team.</p> <p>Accordingly, the verification team has focused on abilities, qualifications and recognition of involved personnel and institutions of the measuring team involved in the WBT. Competence / training evidence of the monitoring personnel have been provided to the verification team. During the remote interviews it was confirmed that the team was qualified as confirmed by reviewed training / competency documents and trained to carry out WBT in line with the protocol. The monitoring equipment used for conducting the stove efficiency tests are thermometer, weighing scale and moisture meter. These equipment are duly calibrated and hence deemed to be acceptable.</p>
17.	<p>Does the PP have a process in place to ensure data quality is maintained to a high standard? This should include:</p> <ol style="list-style-type: none"> Are the personnel trained and experienced? What is the level of supervision and guidance provided to staff? Is there a standardized system for data entry and analysis to produce final result? Is there a system or process in place to minimize the introduction of errors? Is there a system in place to ensure all collected data is processed; Are quality checks performed on data entered, for example range checks, inconsistency checks, checking of subsamples of data by 	<p>Verification team based on review of provided supporting documents and remote interviews confirms the following:</p> <ul style="list-style-type: none"> ✓ the personnel involved in the WBT/surveys are trained and experienced. ✓ there exists a standardized system for data entry and analysis to produce final result. ✓ there exist a system or process in place to minimize the introduction of errors. ✓ there is a system in place to ensure all collected data is processed. there exists a quality checks of data entered.

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	<p>supervisors;</p> <p>h) is there a system to check for errors, record and report errors reported and document the remedial action taken;</p> <p>i) What is the level of security and type of backup processes to guarantee data integrity, for example methods to prevent fraud and accidental deletion?</p>	
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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		