



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

**BASIC INFORMATION**

<b>Title and UNFCCC reference number of the programme of activities (PoA)</b>	Title: Madagascar Improved Cookstove Project by KCM UNFCCC Reference: 10443	
<b>Version number(s) of the PoA-DD(s) to which this report applies</b>	4.0	
<b>Version number of the verification and certification report</b>	03	
<b>Completion date of the verification and certification report</b>	18/05/2020	
<b>Monitoring period number and duration of this monitoring period</b>	Monitoring Period Number 01 01/01/2019 to 31/05/2019 (inclusive of both days)	
<b>Number and version number of the monitoring report to which this report applies</b>	Monitoring Report number 01 Version 03.1	
<b>Coordinating/managing entity (CME)</b>	Korea Carbon Management Ltd.	
<b>Host Parties</b>	<b>Host Parties of the PoA</b>	<b>Is this a host Party to a CPA covered in this report?(yes/no)</b>
	Republic of Madagascar	Yes
<b>Applied methodologies and standardized baselines</b>	Applied Methodology: AMS II.G "Energy efficiency measures in thermal applications of non-renewable biomass" Version-09.0 Reference: EB 97 Annex-11, valid from 01/11/2017	
<b>Mandatory sectoral scopes</b>	Sectoral Scope 3 : Energy demand	
<b>Conditional sectoral scopes, if applicable</b>	NA	
<b>Estimated amount of GHG emission reductions or GHG removals for this monitoring period in the included CPAs covered in this report</b>	47,005 tCO <sub>2</sub> e	
<b>Certified amount of GHG emission reductions or GHG removals for this monitoring period for the included CPAs covered in this report</b>	16,365 tCO <sub>2</sub> e	
<b>Name and UNFCCC reference number of the DOE</b>	LGAI Technological Center, S.A. (Applus+ Certification) UNFCCC Ref. No.: E-0032	
<b>Name, position and signature of the approver of the verification and certification report</b>	Mr. Juan Sendín Caballero Applus+ Certification Business Unit Managing Director Signature:	

## SECTION A. Executive summary

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The registered PoA involves the promotion and distribution of improved cooking stoves (ICS) in Madagascar. The ICS (currently “SoaRehitra” wood stove is the model distributed) disseminated through this programme has replaced the prevailing inefficient three-stone open fires or equivalent with stoves, which combust wood more efficiently, and improve thermal transfer to pots, hence saving fuel and lowering greenhouse gas emissions. This monitoring period includes the implementation and monitoring of three CPAs (i.e. UN Ref. CPA 10443-P1-0001-CP1, CPA 10443-P1-0002-CP1 and CPA 10443-P1-0003-CP1 as referred under the reference number/14/ and also the respective approved validation reports under reference numbers /16/, /26/ and /27/) as part of the registered PoA within the geographical boundary of Madagascar. The CME, Korea Carbon Management Ltd.(hereinafter also referred to as KCM or simply as CME) has fully financed all improved cook stoves distributed to the households under the CPAs including CPA implementation costs.

Detailed implementation status of the implemented CPAs has been discussed in subsequent sections of this report and CME has also reported the same in monitoring report, thus complying with §259 of CDM PS for PoA, V2/17/ and §340 of CDM VVS for PoA, V2/17/.

LGA Technological Center, S.A.(hereafter referred to as Applus+ Certification) has performed the first verification of the CDM PoA “Madagascar Improved Cook-stove Project by KCM” having its UNFCCC PoA Reference Number 10443. The verification includes confirming the implementation of the monitoring plan of the registered PoA-DD, CPA-DDs and the application of the monitoring methodology as per AMS-II.G., Version 09/18/. A site visit was conducted to check the implementation of registered monitoring plan and verify the data submitted in the monitoring report.

Applus+ Certification confirms the following has been reviewed;

- (a) The registered PoA-DD (i.e. version 04, dated 15/10/2018), CPA-DDs (i.e. 10443-0001, 10443-0002 and 10443-0003) and the monitoring plan, and the corresponding validation opinion;
- (b) The validation report;
- (c) The applied monitoring methodology;
- (d) The monitoring report to verify that it is as per the standardized format;
- (e) CER calculations sheets and all supporting documents;
- (f) Any other information and references relevant to the project activity’s emission reductions;
- (g) Relevant decisions, clarifications and guidance from the CMP and the CDM Executive Board;

Applus+ Certification confirms that the monitoring system is in place and the emission reductions are calculated without material misstatements.

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

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)	Involvement in			
						Desk/document review	On-site inspection	Interview(s)	Verification findings
1.	Lead Auditor/ Technical Expert	OR	Ahirwar	Vivek Kumar	GCEES	Y	Y	Y	Y

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

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)
1.	Technical Reviewer Technical Expert	EI	Cortés Díaz	Miguel A.	Central Office
2.	Technical Reviewer Technical Expert in training	EI	Shen	Simon	Central Office
3.	Approver	IR	Sendin Caballero	Juan	Central Office

**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.	Error in Data Transfer from Digital Records, Hard copy Records to ER Spread sheet for the monitoring parameters and sampling survey results. The errors could result from human errors during the information transfer from the source to emission reduction sheet.	High	The parameters were used in the calculation of emission reductions.	Since most of the monitoring parameter were confirmed through ex-post monitoring survey conducted by CME, the verification team physically checked and verified the sample households from first ex post monitoring survey records/4/ and ICS registration database/5/. Also compared PoA-DD/14/, CPA-DD/14/ and reference documents with ER spread sheet/3/ to check for any material error during data transfer.

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

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The identified/selected materiality threshold for the PoA under current monitoring period is 5% as PoA is small scale in accordance with §308(d) of CDM VVS for PoA, V2/17/.

	MR Version (version 01)	MR Version (Final, version 03.1)
Emission reductions/annum	16,442	16,365
Identified Threshold	5.0%	5.0%

In accordance to the §40 of the applied methodology/18/, the sample size is determined by either 95/10 (for biennial inspection) or 90/10 (for annual inspection) confidence /precision. However, CME has considered 95/10 confidence /precision for annual sampling in the first ex-post monitoring survey/4/. The verification team confirms that the sample size considered by CME is more conservative and shall give more accurate result.

Parameter	Reporting Frequency	No. of Discreet Data (100%)	Sample size selected for verification	Type of error identified (Isolated/Systematic)	Impact on ERs	
					Extrapolate d for population size (Qtyand %)	Within Threshold (Yes/No)
$N_{y,i,j}$	At least once every two years through Monitoring Survey	44 samples from CME's monitoring survey	18 samples from CME's monitoring survey records (Acceptance sampling)	No error found.	No Impact	Yes
<b>Date of commissioning of project device <i>i</i></b>	Continuous recording at the time of distribution of project devices	22,563 ICS distributed during the Monitoring period	Random cross check of ICS records from ICS registration database/5/ and hard copy of End User Agreement/11/	No error found.	No Impact	Yes
$\mu_{y,i,j}$	At least once every two years through Monitoring Survey	13samples from CME's monitoring survey	18 samples from CME's monitoring survey records (Acceptance sampling)	No error found.	No Impact	Yes
$\eta_{new,i,j}$	At least once every two years through Monitoring Survey	13 ICS	All WBT results has been verified through WBT Survey reports/6/	No error found.	No Impact	Yes
$N_{d,HH}$	Continuous recording at the time of distribution of project devices	22,563 ICS distributed during the Monitoring period to 22,563 households	Thorough crosscheck of ICS records from ICS registration database/5/ and hard copy of End User Agreement/11/	No error found.	No Impact	Yes

Based on the above table, it can be confirmed that materiality threshold applicable for the PoA as per §308(d) of CDM VVS for PoA, V2/17/ is not breached.

Since most of the data is confirmed through ex post monitoring survey conducted by CME, the verification team has cross verified the ex-post survey data by applying acceptance sampling approach (a total of 44 numbers of ICS were surveyed by CME). All ex-ante parameters were directly cross-checked from the PoA-

DD/14/ and CPA-DDs/14/ and also the respective validation reports of the CPAs i.e. CPA 10443-P1-0001-CP1/16/, CPA 10443-P1-0002-CP1/26/ and CPA 10443-P1-0003-CP1/27/.

Verification team confirms that, there was no gap identified in the values of ex-ante parameters.

## SECTION D. Means of verification

### D.1. Desk/documenter view

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The desk review involves;

- A review of the data and information presented to verify their completeness;
- A review of the monitoring plan, the monitoring methodology including applicable tool(s) and, where applicable, the applied standardized baseline, paying particular attention to the frequency of measurements, the quality of metering equipment including calibration requirements, and the quality assurance and quality control procedures;
- A review of calculations and assumptions made in determining the GHG data and emission reductions;
- An evaluation of data management and the quality assurance and quality control system in the context of their influence on the generation and reporting of emission reductions;

The list of documents/evidences reviewed during the verification is provided under Appendix 3 of this report.

**D.2. On-site inspection**

Duration of on-site inspection: 02/07/2019 to 04/07/2019				
No.	Activity performed on-site	Site location	Date	Team member
1.	Implementation and Operation of the CDM programme of activity based on registered Monitoring Plan and physical features of the project activity as per approved POA-DD and CPA-DDs	Haute Matsiatra regions in Madagascar	02/07/2019, 03/07/2019, 04/07/2019	Vivek Kumar Ahirwar
2.	Information flows for generating, aggregating and reporting the monitoring parameters			
3.	Competency of the operating personnel, monitoring personnel and calibrating agencies			
4.	Data collection procedures			
5.	Calibration performance and monitoring practices followed for monitoring equipment's used in the project activity			
6.	Quality Control and Quality Assurance procedures against the approved monitoring plan			
7.	Calculation and assumptions made in determining the GHG data and emission reductions			
8.	Compliance with CDM criterion and relevant guidance with respect to monitoring plan			
9.	Physical site visit : 18 Households visited (Implementation of PoA)			

**D.3. Interviews**

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1.	Tiana	Manantsoa	NGO Tandavanala, Director	02/07/2019 – 04/07/2019	Implementation of CPAs, monitoring activities, record keeping; Ex post Monitoring Survey; Corrections in MR and ER sheet; Sampling approach, results and ER calculations	Vivek Kumar Ahirwar
2.	Andriamampihatona	Famatoa	NGO Tandavanala, CDM manager			
3.	Borah	Deepjyoti	Sr. Advisor, CME Representative			
4.	H	Rivo	Chief of Zone			
5.	Raibe	Ramanand	Independent household representative			
6.	Rina	Rasoani				
7.	Drasana	Rasoani				
8.	Pionona	Rasoamam				
9.	Drasoa	Razafin				
10.	Ina	Haingonir				
11.	Afyhe	Razanaj				
12.	Kaj	Razana				
13.	Rina	Razafini				
14.	Rina	Ravaoni				
15.	Rina	Rafanjan				
16.		Tolojanahary				

17.	Ana	Rahajariman				
18.	A	Razarasoa				
19.	Rina	Rasoani				
20.	Drasana	Rasoanan				
21.	Ro	Razanana				
22.	Dro	Ratsiakiton				

#### D.4. Sampling approach

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##### CME's sampling approach:

The CME has applied a sampling approach as per approved sampling plan registered under the PoA-DD/14/ and in registered CPA-DDs/14/. The stove type/model is the same across all the three CPAs, i.e. "SaoRehitra" wood stove. Therefore, in line with the registered sampling plan, representative sampling has been undertaken as part of a PoA-wide Sampling Plan (i.e. by grouping and sampling across the three CPAs) that is designed in line with the requirements of the "Sampling and surveys for CDM project activities and programme of activities", version 04. CME has considered 95/10 confidence/precision sampling to consider three CPAs under one sampling, which is more appropriate given the length of the monitoring period. The sampling approach undertaken by CME is duly explained under Section E.3 of monitoring report/2/.

##### DOE's sampling approach:

In order to meet the requirements of §24 of Standard for "Sampling and surveys for CDM project activities and programmes of activities", Version 07/23/, the verification team applied acceptance sampling in the verification (in accordance with §27 of Standard for "Sampling and surveys for CDM project activities and programmes of activities", Version 07/23/). The verification team selected random sub-samples of CME's sampled records for each CPA, checked the acceptability (or otherwise) of the data for each such record with CME's sample records, and then based on the number of records where there is agreement, determined if the CME's sample records meet the requirements.

The verification team determined the sample size for acceptance sampling by evaluating the following, using its own professional judgment and guidance in the Standard for "Sampling and surveys for CDM project activities and programmes of activities", Version 07/23/:

- The proportion of discrepancies between the CME's sample records and DOE's (field or onsite inspection results) sample records that can be considered acceptable. This is referred to as the AQL (Acceptable Quality Level): 1.0% was considered in this verification.
- The proportion of discrepancies between the CME's sample records and DOE's (field or onsite inspection results) sample records that would be considered unacceptable. This is the UQL (Unacceptable Quality Level): 20% was considered in this verification.
- The producer risk and consumer risk: 10% was considered for both.

Considering the above input values, a sample size of 18 was required as per Table in the Standard for "Sampling and surveys for CDM project activities and programmes of activities", Version 07/23/.

Accordingly, acceptance number (c) thus determined for the sample size is 1. A sample size of 18 (i.e. 8 from CPA 1, 6 from CPA 2 and 4 from CPA 3) meets the criteria. Therefore, the verification team together verified the 18 randomly<sup>1</sup> selected samples during the site visit and observed that all the stoves checked were in operation (100%) as against the CME's surveyed results, which also indicates 100%/4/, across the three CPAs. There was no drop out observed in sample done by the verification team and thus gives a drop out of 0 %. This is considered in line with CME's sampling records and has been accepted by the verification team. It was observed that all the stoves were in working condition and thus less than or equal to c=0, discrepant records were observed with the MR/2/ and ER sheet/3/. Thus, CME's set of records has been accepted in line with §32 of the Standard for "Sampling and surveys for CDM project activities and programmes of activities", Version 07/23/.

The verification team together verified the 18 randomly selected samples out of the total CME samples during site visit and observed that all the results reported by CME for use of baseline stove were consistent

<sup>1</sup>Using online software <https://www.randomizer.org/>



with the survey results. None of the 18 ICS's users found using traditional stoves along with ICS, which means that 0% users still using traditional or baseline stoves or baseline stoves are decommissioned and no longer in use.

However, CME has considered value of ICS Usage rate (100%) as derived from the survey and discounted with a calculated adjustment factor for consumption value for baseline stove use in relative term, which is 96.76% applied in the ER calculation, which is a conservative value and also conservative compared to the DOE onsite survey results. As there were no discrepant records, CME's set of samples were accepted in line with §32 of the Standard for "Sampling and surveys for CDM project activities and programmes of activities", Version 07/23/.

There was no specific or scheduled DOE field survey conducted for new ICS efficiency related parameter as these were checked with the WBT records retained by the CME. The records were consistent with the reported results. The verification team checked 100% of CME's WBT results and found them in order. Nevertheless, for the purpose of internal check and better judgement of ICS efficiency, DOE has conducted WBT on one of the samples (i.e. one operational stove) during the site visit to households. The results of the WBT conducted on site was found to be 35%/25/, which is more than the weighted average value considered by CME (i.e. 31.5%) during the sample WBT test. Hence, DOE would like to further opine that the value of efficiency of new ICS considered for ER calculation is conservative, relevant and hence acceptable.

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

<b>Areas of verification findings</b>	<b>No. of CL</b>	<b>No. of CAR</b>	<b>No. of FAR</b>
<b>General</b>			
Compliance of the monitoring report with the monitoring report form	0	1	0
Remaining forward action requests from validation and/or previous verifications	0	0	0
CPAs considered for verification and covered in this report	0	0	0
<b>Programme of activities</b>			
Compliance of the programme implementation with the registered PoA-DD	0	1	0
Implementation and operation of the management system	0	0	0
Post-registration changes			
• Corrections	0	0	0
• Inclusion of a monitoring plan	0	0	0
• Permanent changes to the registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines, or other methodological regulatory documents <sup>2</sup>	0	0	0
• Changes to the programme design	0	0	0
• Addition of CPA inclusion template	0	0	0
• Change of coordinating/managing entity	0	0	0
• Changes specific to afforestation and reforestation activities	0	0	0
<b>Component project activities</b>			
Compliance of the CPA implementation with the included CPA design document	0	0	0
Post-registration changes			
• Temporary deviations from registered monitoring plan, applied methodologies, standardized baselines or other methodological regulatory documents	0	0	0
• Corrections	0	0	0
• Changes to the start date-of the crediting period	0	0	0
• Inclusion of a monitoring plan	0	0	0

<sup>2</sup> Other standards, methodologies, methodological tools and guidelines (to be) applied in accordance with the applied (selected) methodologies are collectively referred to as the other (applied) methodological regulatory documents).

• Permanent changes to the registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines, or other methodological regulatory documents	0	0	0
• Changes to the project design	0	0	0
• Changes specific to afforestation and reforestation activities	0	0	0
Compliance of the registered monitoring plan with applied methodologies and standardized baselines	0	1	0
Compliance of monitoring activities with the registered monitoring plan			
• Data and parameters fixed ex ante or at renewal of crediting period	0	1	0
• Data and parameters monitored	0	0	0
• Implementation of sampling plan	0	1	0
Compliance with the calibration frequency requirements for measuring instruments	1	0	0
Assessment of data and calculation of emission reductions or net removals			
• Calculation of baseline GHG emissions or baseline net GHG removals by sinks	0	0	0
• Calculation of project GHG emissions or actual net GHG removals by sinks	0	0	0
• Calculation of leakage GHG emissions	0	0	0
• Summary of calculation of GHG emission reductions or net GHG removals by sinks	0	1	0
• Comparison of actual GHG emission reductions or net GHG removals by sinks with estimates in included CPA	0	0	0
• Remarks on difference from estimated value in included CPA	0	0	0
Assessment of reported sustainable development co-benefits	0	0	0
Global stakeholder consultation	0	0	0
Others (please specify)	0	0	0
<b>Total</b>	<b>1</b>	<b>6</b>	<b>0</b>

## SECTION E. Verification findings

### E.1. General

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

<b>Means of verification</b>	The verification team has compared the monitoring report/2/ with a latest applicable monitoring report form, version 03.0/21/. Same has been verified from CDM EB Website.
<b>Findings</b>	CAR-01 has been raised in this context. Refer Appendix 4 of this report for detailed finding.
<b>Conclusion</b>	The verification team confirms that the revised final version (version 03.1, dated 14/05/2020) of the monitoring report submitted to DOE has been appropriately prepared using the latest applicable monitoring report form/21/, and that all sections are complete.

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

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The verification team checked and confirmed that there is no pending FAR for this PoA. Hence no forward action request is to be considered for the current verification.

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

<b>Title and UNFCCC reference number of the CPA included in the PoA as of the end of this monitoring period</b>	<b>Is the CPA considered for this verification? (yes/no)</b>	<b>The date when the CPA was included</b>	<b>Version of the PoA-DD</b>	<b>Confirmation that a request for issuance including the CPA has been published for the previous monitoring period (Y/N)</b>
Madagascar Improved Cookstove Project by KCM-Wood#CPA-W-001  <b>(Ref. CPA 10443-P1-0001-CP1) /16/</b>	Yes	24/12/2018	4.0	No, this is the first verification.
Madagascar Improved Cookstove Project by KCM-Wood#CPA-W-002  <b>(Ref. CPA 10443-P1-0002-CP1) /26/</b>	Yes	02/04/2019	4.0	No, this is the first verification.
Madagascar Improved Cookstove Project by KCM-Wood#CPA-W-003  <b>(Ref. CPA 10443-P1-0003-CP1) /27/</b>	Yes	02/04/2019	4.0	No, this is the first verification.

**E.2. Programme of activities****E.2.1. Compliance of the programme implementation with the registered programme design document**

<b>Means of verification</b>	<p>The registered PoA involves the dissemination (distribution/installation) of improved cooking stoves (ICS) in Madagascar by CME through coordination with local team deployed by CME. The overall responsibility of implementation and operation is with CME (KCM), which was also evident during the site visit. KCM provided stoves free of cost to distribute/install ICS on a non-commercial basis to household using baseline stove. KCM also provided operation &amp; maintenance cost of ICS procurement and distribution to operate the CPAs in financially sustainable condition. KCM has fully financed all ICS distributed to the households under the CPAs. This is consistent with PoA-DD and CPA-DDs/14/.</p> <p>This monitoring period includes the implementation and monitoring of three CPAs (i.e. also referred hereinafter as CPA-0001, CPA-0002 and CPA-0003) as part of PoA/14/wherein CPA-0001 has been fully distributed as per the small scale threshold (the calculation and demonstration are included in the ER sheet and also in the section F.7 of the MR), the CPA-0002 and CPA-0003 are partially distributed. The details of distribution are submitted by CME in the form of excel sheet, which were verified by DOE during the site visit and found consistent. All the CPAs are within the geographical boundary of Madagascar confirmed through iTouchMap website/22a/, which constitutes the physical boundary of PoA as well.</p> <p>In the referenced CPAs, during the monitoring period, a single model/type of the improved cookstove (ICS) i.e., Sao-Rehitra is deployed/distributed. Thus, all CPAs are currently having single ICS model and entire samples are homogenous. The</p>
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assessment team has also visited the manufacturing unit of the ICS (i.e. Sao-Rehitra) to understand the ICS type and technology in detail manner. The ICS type and details are found to be consistent with the details provided under the CPA-DDs.



Stove Model Sao-Rehitra (or called as SR wood stove)

The ICS (*SoaRehitra* stoves) under CPA-0001 have been implemented in several villages and households in the region of Haute Matsiatra, Madagascar.

The ICS (*SoaRehitra* stoves) under CPA-0002 have been implemented in several villages and commune of Districts Ambalavo and Lalangina in the region of Haute Matsiatra, Madagascar.

The ICS (*SoaRehitra* stoves) under CPA-0003 have been implemented in several villages and commune of Districts Vohibato in the region of Haute Matsiatra, Madagascar.

The Fianarantsoa is the capital city from where the local implementation team manages the program for CME. This was confirmed through the ICS registration database of the three CPAs/5/.

The start date of crediting period of the PoA is 01/01/2019/14/. The PoA was registered on 07/09/2018 and first CPA (i.e. CPA 10443-P1-0001-CP1) was included on 24/12/2018. The monitoring period considered under this verification is "01/01/2019 to 31/05/2019", where start date of the monitoring period is the start date of crediting period for the 1<sup>st</sup> CPA. The first stove included in this monitoring period was distributed on 09/10/2018/5/ and has been verified from the End user Agreement signed by the ICS User/11/. However, since crediting period start date for the implemented CPAs are different (i.e. crediting period for CPA-0001 starts from 01/01/2019, for CPA-0002 & CPA-0003 it starts from 02/04/2019), the emission reduction accounting for respective CPAs are considered accordingly. Also, the monitoring period covers till the month of May 2019, therefore the total numbers of ICS distributed as on the last date of stove distribution (which is 15/05/2019) under the CPAs during the month of May 2019, were considered for ER estimation.

The total number of stoves that were distributed under the current monitoring period (as described above) were verified as under:

CPA 1 (Ref. CPA 10443-P1-0001-CP1)	Start date of ER accounting	Total Nos. of Stove distributed
Total stoves distributed as on 31 <sup>st</sup> Dec 2018	01-Jan-19	10,000
Total stoves distributed in January 2019 (last date of distribution in the month was 30 <sup>th</sup> Jan)	31-Jan-19	1,503
Total stoves distributed in February 2019 (last date of distribution in the month was 27 <sup>th</sup> Feb)	28-Feb-19	2,177

		Total =	13,680
	<b>CPA 2 (Ref. CPA 10443-P1-0002-CP1)</b>	<b>Start date of ER accounting</b>	<b>Total Nos. of Stove distributed</b>
	Total stoves distributed in March 2019	02-Apr-19	2139
	Total stoves distributed in April 2019 (last date of distribution was 30 <sup>th</sup> April)	01-May-19	966
	Total stoves distributed in May 2019 (last date of distribution was 14 <sup>th</sup> May)	15-May-19	1865
		Total =	4,970
	<b>CPA 3 (Ref. CPA 10443-P1-0001-CP1)</b>	<b>Start date of ER accounting</b>	<b>Total Nos. of Stove distributed</b>
	Total stoves distributed in March 2019	02-Apr-19	2367
	Total stoves distributed in April 2019 (last date of distribution was 30 <sup>th</sup> April)	01-May-19	489
	Total stoves distributed in May 2019 (last date of distribution was 14 <sup>th</sup> May)	15-May-19	1057
		Total =	3,913
	<p>Here the start date of ER accounting for each month has been considered separately for a group of stoves distributed for that particular month. This approach is found to be conservative as CME has considered the last date of distribution of a particular month as the date of complete commissioning of the stove batch distributed for that particular month (here a batch is referred to as total numbers of stoves distributed in a particular month). Therefore, start date of accounting of emission reductions for stoves distributed in a particular month has been considered as the next day of the last date of stove distribution for that month, which is conservative.</p> <p>Therefore, the quantity, specification and target group of the ICSs were found in accordance with the PoA-DD and respective CPA-DDs/14/. Further, based on the review of ICS registration database of ICS/5/, physical observations and interview conducted during the site visit, the verification team found that the actual implementation on ground of the PoA is consistent with PoA-DD and respective CPA-DDs/14/.</p>		
<b>Findings</b>	CAR-02 has been raised in this context. Refer Appendix 4 of this report for detailed finding.		
<b>Conclusion</b>	<p>The verification team confirms that -</p> <ul style="list-style-type: none"> <li>• The physical features (technology/type of ICS) of the implementation were in accordance with the registered PoA-DD and CPA-DDs/14/.</li> <li>• The first CPA included ICSs up-to its full capacity (i.e. up-to the small scale threshold). However, the distribution of ICS is still ongoing under the 2<sup>nd</sup> and 3<sup>rd</sup> CPA as they have not yet reached the estimated quantity given in the respective CPA-DDs/14/.</li> <li>• The actual operation is in line to respective CPA-DDs, which is further explained under Section I.1 of this report.</li> <li>• No information with regard to data and variables was identified that may surpass the estimated quantity of ERs in the respective CPA-DD/14/.</li> <li>• The emission reductions achieved for the three CPAs were within the estimated quantity in the registered CPA-DDs/14/.</li> </ul>		

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

<b>Means of verification</b>	Based on the interview of CME representative (CME) and monitoring team during the site visit, it was confirmed that the CME has organized an appropriate management and operational system for implementation, monitoring and reporting
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	<p>functions.</p> <p>Korea Carbon Management Ltd. (CME and CPA implementer) has a database manager who manages the process of collecting the information of installed/registered ICS from the field staff through stove distribution team and entering the data into the ICS registration database. The monitoring manager at the CME/14/ is then responsible for QA/QC of the data, analysis and reporting into the monitoring report. For survey data, a monitoring team has been organized by the CME's survey coordinator consisting of trained monitoring staff called survey supervisors and also a thermal energy expert/2/, who conducted the surveys and WBTs. The monitoring manager at the CME/14/ is responsible for QA/QC of the data, analysis and reporting into the monitoring report. Proper training/20/ of all field staff and survey supervisors was provided by the CME before starting distribution of ICSs and conducting the monitoring survey.</p> <p>CME field staff continually randomly selects households included in the ICS registration database and visit them to cross-check the information on the ICS registration database with the actual evidence in the field, referred as spot check. As per prescribed practice, any inconsistencies found (e.g., change in the address of a user) are to be updated on the ICS registration database, and in case, ICS are found to be no longer in use, they will be clearly marked as such and excluded from emission reductions calculations. There is provision of replacement in the registered PoA-DD which confirms that "in case a replacement stove is being issued to a customer already registered on the project database, a new registration will not be required. The replacement stove will be recorded in the project database in such a way that it is clear that the replaced stove ceases to be included in the CPA; and the replacement stove is associated with the customer's details as a new ICS, and is included in the CPA as a new ICS with a new serial number"./14/.</p> <p>The ICS registration databases/5/ containing the monitored data were maintained by the CME. The ICS registration database (and its backup) was checked during the site visit. There is no case of any inconsistency or non-operational or replacement during the current monitoring period. The ICS registration database is stored in electronic format /5/ as well as hard copies of end user agreements/11/ and completed survey forms and WBT test reports/6/ is retained by the CME. PoA management system has been reviewed by the project manager at CME on regular basis for timely identification and resolution of issues related to the distribution of ICS and monitoring of PoA.</p> <p>The organizational structure and roles and responsibilities for monitoring are in line with the situation on the ground as observed during the site visit and interview with monitoring staff, and the structure is considered appropriate.</p>
<b>Findings</b>	No finding has been raised.
<b>Conclusion</b>	The verification team assessed the management systems in place to implement the monitoring of the PoA/14/. This included the roles and responsibilities, data collection, transfer and aggregation procedures, data storage and archiving for the monitoring system. This has been described in detail in the MR final version, version 03.1 dated 14/05/2020/2/. The verification team confirms that the monitoring management system of the PoA is in place with the responsibilities properly identified and established.

### E.2.3. Post-registration changes

#### E.2.3.1. Corrections

>>

Not applicable, since there was no correction applied as post-registration change.

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

>>

Not applicable, since monitoring plan was included in the registered PoA-DD/14/.

**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**

&gt;&gt;

Not applicable, since there was no correction applied as post-registration change.

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

&gt;&gt;

No project design changes were identified during the current monitoring period.

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

&gt;&gt;

Not Applicable.

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

&gt;&gt;

No changes in CME during the current monitoring period.

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

&gt;&gt;

Not Applicable.

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

<b>Means of verification</b>	<p>There are 03 specific CPAs (Ref. nos. 10443-P1-0001-CP1, 10443-P1-0002-CP1 and 10443-P1-0003-CP1) included in the PoA/14/ at the end of the current monitoring period and all the three CPAs were covered in the current monitoring period.</p> <p>CPAs target the promotion and distribution of portable ICS models Sao-Rehitra (SR). The Verification Team has carried out onsite visits at the fields and also at the production plant and conducted interviews to reach up-to a level of satisfaction and professional judgement. ICS model SR wood stove was checked and compared to that described in the CPA-DD/14/. Korea Carbon Management Ltd.(also referred as KCM) is the Coordinating and Managing Entity (CME) for the implementation of the CPAs. The KCM coordinates and manages CPA implementation and manages each element of the monitoring plan. The implementation and operation status of the CPAs has been verified as follows:</p> <p>In CPA-0001, ICS were distributed in several villages and households in the region of Haute Matsiatra, Madagascar, in CPA-0002, ICS were distributed in several villages and commune of Districts Ambalavo and Lalangina in the region of Haute Matsiatra, Madagascar and in CPA-0003, ICS were distributed in several villages and commune of Districts Vohibato in the region of Haute Matsiatra, Madagascar confirmed from ICS registration database/5/ and during onsite visit, which is consistent with the description given in the included CPA-DD-0001, CPA-DD-0002 and CPA-DD-0003 (Section A.2)/14/. By the end of current monitoring period a total of 22,563 improved cook stoves (the breakup of ICS numbers across the three CPAs are provided under the section E.2.1 above) were disseminated under the three CPAs, which is within estimated quantity of the small scale threshold as per CPA-DD/14/. This figure is also consistent with the webhosted MR and the ER sheet, further cross checked with the stove distribution database.</p> <p>The stoves are distributed to end users after each end user signs and accepts the End User Agreement/11/. The other details e.g., user name, identification number, address, phone number etc. are also recorded in Information Request Form, which is part of the End User Agreement/11/.</p>
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The ICS registration database records the stove unique serial number ID and name of recipients with residential address. Stove IDs are used for unique identification of the units. Name of KCM (as shown below) is printed on the body of the stove and Unique Stove IDs are marked on the stoves, on a name plate that is attached to the stove. A picture of the stove unique ID is presented below as an example.



ICS "SR Stove": Unique Serial Number



CME Logo

As shown in the image, the unique serial code of the project stove are nomenclature as <year><StoveType><fuel type><CPA number><number assigned to that particular stove>. For example, let's consider the following serial number "18SRWX1-XXXX1" for a project stove.

Here, the inscription "18" stands for particular year (i.e. 2018), "SR" for stove type e.g. "Soa-Rehitra" and "W" for fuel type, i.e. Woody biomass, Serial number X1 stands for CPA number and XXXX1 stand for serial number inscribed to the stove at the time of production.



The assessment team has also confirmed the unique identification system for the ICS are consistent with the prescribed method in the registered PoA-DD and CPA-DDs. Thus, each and every stove can be uniquely identified and can be cross checked from distribution database as well as from the user's agreement copy. This is in line with the procedure to avoid double counting of ICS, as mentioned in registered PoA-DD (page 8)/14/.

The operation/use of ICS starts from the same day or next day of the date of distribution of ICS to end User/5/. Same has been verified from the interview with end users during DOE onsite visit/13/ of randomly selected households. Once the ICS is installed it is revisited by CMEs field staff after few days/weeks (in general) to check whether the ICS functioning correctly. From the on-site verification and from the interviews DOE has confirmed that there was no case of inconsistency or non-operation of stoves during the monitoring period, thus no replacement of ICS took place during the period.

The type of stoves distributed was confirmed to be Sao-Rehitra wood stove, based on site visit observations in households. This is consistent with the registered CPA-DDs/14/. In accordance with §364 of CDM VVS for PoA, version 02.0/17/, verification team confirms that the annual energy saving of the project ICS for this monitoring period is only 13.031MWh<sub>th</sub>/3/ which is very much less than 1% of the



	<p>small-scale CDM thresholds i.e. 1800 MWh<sub>th</sub> and satisfies the condition to qualify as a microscale CDM unit. The reference calculations are also submitted by CME under the ER sheet (final version 03) and explanation is provided under the MR section F.7 of the revised MR (final version 03.1)/2/.</p> <p>The final MR (i.e. version 03.1)/2/ includes complete description of the implementation status, which is consistent with the observations and interviews during the site visit as well as review of the ICS registration database/5/.</p>
<b>Findings</b>	CL-01 and CAR#3 has been raised in this context. Refer Appendix 4 of this report for detailed finding.
<b>Conclusion</b>	<p>The verification team confirms that physical features of the three CPAs have been implemented in accordance with the registered CPA-DDs/14/. No specific monitoring equipment had to be installed according to the monitoring plan. It is also confirmed, through the physical site visit and review of the supporting documentation that physical features of the CPAs have been implemented in accordance with the CPA-DDs/14/.</p> <p>The three CPAs were also found to be completely operational in line with the CPA-DDs/14/. The information provided in the relevant sections of the monitoring report is appropriately described the implementation and operational status of the PoA/14/.</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**

>>

No deviations were identified during the verification of current monitoring period.

#### **E.3.2.2. Corrections**

>>

No corrections were identified during the verification of current monitoring period.

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

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No changes in the start date of the crediting period envisaged during the verification of current monitoring period.

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

>>

Not Applicable.

#### **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**

>>

No permanent changes were identified during the verification of current monitoring period

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

>>

No project design changes were identified during the verification of current monitoring period.

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

>>

Not Applicable.

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

<b>Means of verification</b>	The monitoring plan as contained in CPA-DDs/14/ was reviewed against the monitoring requirements of the applied methodology AMS-II.G, Version 09/18/ as well as PoA-DD/14/. Based on this review it was found the monitoring plan contained in the CPA-DD/14/ includes all the required parameters to be monitored in the context of the CPA design and description and allows proper determination of emission reductions in accordance with PoA-DD/14/ and applied methodology/18/.
<b>Findings</b>	No finding has been raised.
<b>Conclusion</b>	The monitoring plan is in accordance with the approved methodology, AMS-II.G., Version 09/18/, that is included in the registered CPA-DDs/14/.

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

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

<b>Means of verification</b>	<p>The values of, <math>f_{NRB}</math>, <math>NCV_{biomass}</math>, <math>\eta_{old}</math>, <math>EF_{projected\_fossilfuel}</math>, <math>LF_y</math>, <b>Life Span</b>, <math>B_{old,HH}</math> and <math>B_{old,i,j}</math> have been fixed ex-ante during registration of the CPA-DD/14/. Accordingly, the values were checked and confirmed with the registered PoA-DD/14/ and respective CPA-DDs/14/.</p> <p><b>1. Data/Parameter, Unit: <math>f_{NRB}</math>, Fraction</b>  Description: Fraction of woody biomass saved by the project activity in year y that can be established as non-renewable biomass.  Verified Value: 0.966 (for all the CPAs)</p> <p>To be determined at CPA level as per approved revised PoA-DD/14/ and consistent with the respective CPA-DD/14/ and fixed ex-ante.</p> <p>The <math>f_{NRB}</math> value (i.e. 0.966) for the three CPAs included under the current monitoring period was already validated by validating DOE at CPA level before their inclusion into the PoA; and this is an ex-ante parameter.</p> <p>In accordance with the requirement of Methodology AMS II G version 09 para 39 (a), CME has determined the local <math>f_{NRB}</math> value (sub national values) as per the methodological Tool 30 "Calculation of fraction of non-renewable biomass" version 01/28/. The three CPAs included under the current verification are applied with the version 01 of the Tool 30 "Calculation of fraction of non-renewable biomass"/28/ which was applicable at the time of CPA inclusion, hence applied tool is valid.</p> <p>The CME has provided the <math>f_{NRB}</math> value calculation sheet /29/ where the fraction of woody biomass is calculated as per formula Equation (1), (3), (5) &amp; (6) given in para 9, para 11, para 14 and para 17 of Tool 30 "Calculation of fraction of non-renewable biomass" version 01 /28/ respectively.</p> <p>The input value used in the calculation are sourced from survey conducted by a local Centre for Information &amp; Research named "CEDII", which was further validated and accepted by host country DNA in Madagascar/30/. The CME has submitted the DNA approved "<math>f_{NRB}</math> value calculation" /29/ conducted by "CEDII"/30/. Based on review of this approved Report/30/ confirmed that the calculated <math>f_{NRB}</math> value, i.e. 96.6% is applicable in the regional and sub-national level across the administrative regions in the Province of Fianarantsoa including: Haute Matsiatra, Atsimo-Atsinanana, Vatovavy-Fitovinany and Amoron'i Mania. The three CPAs included under the PoA are fall under these regions; hence <math>f_{NRB}</math> value used for ER calculation is applicable. The calculation and formulae provided in the report are found to be correct and accordance with the Tool 30 version 01/28/. Thus the assessment team has confirmed that the <math>f_{NRB}</math> value for the three CPAs is found to correctly applied as 0.966 in accordance to AMS II G version 09 para 39 (a) and Tool 30 "Calculation of fraction of non-renewable biomass" version 01.</p>
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	<p><b>2. Data/Parameter, Unit: <math>NCV_{biomass}</math>, TJ/ tonne</b>  Description: Net calorific value of biomass  Verified Value: 0.0156  IPCC 2006 default value for biomass applied in accordance with applied methodology AMS II.G, Version 09/18/. Consistent with the approved revised PoA-DD/14/ and respective CPA-DD/14/ and fixed ex-ante.</p> <p><b>3. Data/Parameter, Unit: <math>\eta_{old}</math>, Fraction</b>  Description: Efficiency of 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; for other types of devices, a default value of 0.2 may be optionally used. Weighted average values will be used (taking the amount of woody biomass consumed by each device as the weighting factor) if more than one type of device is being replaced  Verified Value: 0.10  Default value in accordance with Data / Parameter AMS II.G, version 09/18/. Consistent with the registered PoA-DD/14/ and respective CPA-DDs/14/ and fixed ex-ante.</p> <p><b>4. Data/Parameter, Unit: <math>EF_{projected\_fossilfuel}</math>, <math>TCO_2/TJ</math></b>  Description: Emission factor for the fossil fuels projected to be used for substitution of non-renewable woody biomass by similar consumers  Verified Value: 63.7  IPCC 2006 default value in accordance with applied methodology AMS II.G, Version 09/18/. Consistent with the registered PoA-DD/14/ and respective CPA-DDs/14/ and fixed ex-ante.</p> <p><b>5. Data/Parameter, Unit: <math>LF_y</math>, Fraction</b>  Description: Leakage adjustment factor  Verified Value: 0.95  Default value in accordance with the AMS II.G, Version 09/18/. Consistent with the registered PoA-DD/14/ and respective CPA-DDs/14/ and fixed ex-ante</p> <p><b>6. Data/Parameter, Unit: Life Span, Number of years</b>  Description: Operating life time of the Sao-Rehitra  Verified Value: 5.5  Fixed and recorded at the time of commissioning/distribution and certified by Manufacturer/7/. Consistent with the respective CPA-DDs/14/ and fixed ex-ante.</p> <p><b>7. Data/Parameter, Unit: <math>B_{old,HH}</math>, tonnes/household/year</b>  Description: Annual quantity of woody biomass that would have been used in the household in the absence of the project activity to generate useful thermal energy equivalent to that provided by the project devices  Verified Value: 4.39  Consistent with the respective CPA-DDs/14/ and fixed ex-ante at CPA level.</p> <p><b>8. Data/Parameter, Unit: <math>B_{old,i,j}</math>, tonnes / year</b>  Description: Annual quantity of woody biomass that would have been used in the absence of the project activity to generate useful thermal energy equivalent to that provided by the project device type <math>i</math> and batch <math>j</math>  Verified Value: 4.39  Consistent with the respective CPA-DDs/14/ and fixed ex-ante at CPA level.</p>
<b>Findings</b>	CAR#3 has been raised in this context. Refer Appendix 4 of this report for detailed finding.
<b>Conclusion</b>	The values of ex ante fixed parameters have been verified from the registered PoA-DD/14/ and respective CPA-DDs/14/. Same has been crosschecked with the source mentioned in the CPA-DD/14/ and found to be consistent. The verification team confirms that the values used/applied are correct and justified. Also, the ex-ante values have been correctly applied in the calculation of emission reductions.

## E.3.4.2. Data and parameters monitored

<b>Means of verification</b>	<p>The monitoring has been carried out in accordance with the monitoring plan contained in the registered PoA-DD/14/ and respective CPA-DDs/14/. During the verification, all relevant monitoring parameter have been verified about the appropriateness of the verification method, the correctness of the values applied for ER calculation, the accuracy, and applied QA/QC measures:</p> <p>1. Data/Parameter, Unit: <b><math>N_{y,i,j}</math></b>, <b>Number of units</b>  Description: Number of project devices of type <i>i</i> and batch <i>j</i> operating during year <i>y</i></p> <table border="1"> <tr> <td data-bbox="501 470 983 1111">Measuring /Reading /Recording frequency</td><td data-bbox="983 470 1415 1111">The monitoring frequency is at least once every two years in the CPA-DD and PoA-DD/14/. In accordance with of CPA-DD and PoA-DD/14/ the required confidence level and precision for sampling is 95/10 for annual and 95/5 for biennial sampling across CPAs (as per Methodology AMS-II.G version 09.0). In case a single CPA is sampled 90/10 confidence/precision for annual and 95/5 confidence/precision shall be required for biennial sampling.As PP has taken monitoring period 5 month they have taken 95/10 confidence level and precision.</td></tr> <tr> <td data-bbox="501 1111 983 1574">Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)</td><td data-bbox="983 1111 1415 1574">PoA-DD/14/ the required confidence level and precision for sampling is 95/10.  The §40 of applied methodology/18/allows the monitoring frequency to be annual or biennial provided confidence level and precision 90/10 for annual and 95/5 for biennial for single CPA are appropriately considered. In the current monitoring period three CPAs are sampled, 95/10 confidence level and precision has been considered for monitoring at CPA level, which is acceptable considering required confidence level achieved.</td></tr> <tr> <td data-bbox="501 1574 983 1641">Monitoring equipment</td><td data-bbox="983 1574 1415 1641">Not applicable</td></tr> <tr> <td data-bbox="501 1641 983 1946">Is accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer's specification?</td><td data-bbox="983 1641 1415 1946">Not applicable</td></tr> </table>	Measuring /Reading /Recording frequency	The monitoring frequency is at least once every two years in the CPA-DD and PoA-DD/14/. In accordance with of CPA-DD and PoA-DD/14/ the required confidence level and precision for sampling is 95/10 for annual and 95/5 for biennial sampling across CPAs (as per Methodology AMS-II.G version 09.0). In case a single CPA is sampled 90/10 confidence/precision for annual and 95/5 confidence/precision shall be required for biennial sampling.As PP has taken monitoring period 5 month they have taken 95/10 confidence level and precision.	Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	PoA-DD/14/ the required confidence level and precision for sampling is 95/10.  The §40 of applied methodology/18/allows the monitoring frequency to be annual or biennial provided confidence level and precision 90/10 for annual and 95/5 for biennial for single CPA are appropriately considered. In the current monitoring period three CPAs are sampled, 95/10 confidence level and precision has been considered for monitoring at CPA level, which is acceptable considering required confidence level achieved.	Monitoring equipment	Not applicable	Is accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer's specification?	Not applicable
Measuring /Reading /Recording frequency	The monitoring frequency is at least once every two years in the CPA-DD and PoA-DD/14/. In accordance with of CPA-DD and PoA-DD/14/ the required confidence level and precision for sampling is 95/10 for annual and 95/5 for biennial sampling across CPAs (as per Methodology AMS-II.G version 09.0). In case a single CPA is sampled 90/10 confidence/precision for annual and 95/5 confidence/precision shall be required for biennial sampling.As PP has taken monitoring period 5 month they have taken 95/10 confidence level and precision.								
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	PoA-DD/14/ the required confidence level and precision for sampling is 95/10.  The §40 of applied methodology/18/allows the monitoring frequency to be annual or biennial provided confidence level and precision 90/10 for annual and 95/5 for biennial for single CPA are appropriately considered. In the current monitoring period three CPAs are sampled, 95/10 confidence level and precision has been considered for monitoring at CPA level, which is acceptable considering required confidence level achieved.								
Monitoring equipment	Not applicable								
Is accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer's specification?	Not applicable								

	Is the accuracy valid for the entire measuring range or do different accuracy levels apply to different measuring ranges?	Not applicable
	Calibration frequency /interval:	Not applicable
	Is the calibration interval in line with the monitoring plan and/or methodology? If the monitoring plan does not specify the frequency of calibration, is the selected frequency in accordance with the local/national standards, or as per the manufacturer's specifications?	Not applicable
	Is the calibration of measuring equipment carried out by an accredited person or institution?	Not applicable
	Is(are) calibration(s) valid for the whole reporting period?	Not applicable
	Is the calibration carried out for a measuring range comparable with the range for which measurements have been carried out?	Not applicable
	How were the values in the monitoring report verified?	<p>The value of parameter is calculated based on the results of the sampling survey that was conducted by CME at PoA level by grouping all the CPAs that are considered in the current monitoring period. This survey provided the fraction of ICS type for the CPAs. In all, total 44 samples (34 samples from 1<sup>st</sup> CPA and 5 samples each from 2<sup>nd</sup> &amp; 3<sup>rd</sup> samples) for the CPAs were surveyed for this particular parameter. Moreover, another 13 samples which are considered for the baseline usages parameter (i.e. <math>\mu_{y,i,j}</math>) are also surveyed by CME for this parameter <math>N_{y,i,j}</math>. Thus, total sample surveyed was 57.</p> <p>The sample size calculator required a minimum of 43 samples to be surveyed. The calculation for determining the sample size were checked by the verification team from Sample size calculation spreadsheet/4/ and found to be appropriate and consistent with equation in the registered PoA-DD/14/. The verified values are included in the final MR (version 02)/2/. The required level of precision i.e. 10% or less has been achieved at 95% confidence level as mentioned in section E.3.4.3 of</p>

		<p>this report.</p> <p>100% ICS found operating for during the DOE sampling survey.</p> <p>Final verified values for ICS operating during this monitoring period = 22,563 * 100% = 22,563.</p>
	<p>If applicable, has the reported data been cross-checked with other available data?</p>	<p>Yes. The survey results/6/, assumptions and registration records/5/ were checked by the verification team and were found acceptable. The results are reproducible in the corresponding ER spreadsheet (version 04)/3/ of final MR (version 03.1) /2/.</p> <p>The verification team randomly selected 18 samples for DOE's field survey and found that all the ICS were operational, which confirms the CME's sample survey results.</p>
	<p>Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?</p>	<p>Yes. The QA/QC procedure are in place, internal checks have been done by the CME and established during the on-site assessment.</p>
<p>2. Data/Parameter, Unit: <b>Date of commissioning of project device i</b>, <b>Date</b> Description: Actual date of commissioning of the project device i</p>		
	<p>Measuring /Reading /Recording frequency</p>	<p>The data is recorded from start date of ICS distribution 09/10/2018 up to 31/05/2019, which is the end date of monitoring period, whereas the last date of ICS distribution in the month of May 2019 is 14<sup>th</sup> May 2019 as verified in the ICS registration database/5/. The CPA wise distribution records are available and verified by DOE.</p>
	<p>Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)</p>	<p>Yes. The PoA-DD and CPA-DDs/14/ follow the continuous recording frequency.</p>
	<p>Monitoring equipment</p>	<p>Not applicable</p>
	<p>Is accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer's specification?</p>	<p>Not applicable</p>

	Is the accuracy valid for the entire measuring range or do different accuracy levels apply to different measuring ranges?	Not applicable
	Calibration frequency /interval:	Not applicable
	Is the calibration interval in line with the monitoring plan and/or methodology? If the monitoring plan does not specify the frequency of calibration, is the selected frequency in accordance with the local/national standards, or as per the manufacturer's specifications?	Not applicable
	Is the calibration of measuring equipment carried out by an accredited person or institution?	Not applicable
	Is(are) calibration(s) valid for the whole reporting period?	Not applicable
	Is the calibration carried out for a measuring range comparable with the range for which measurements have been carried out?	Not applicable
	How were the values in the monitoring report verified?	<p>The data of distribution of ICS is recorded in End User Agreement/11/ signed by ICS User at the time of ICS distribution to the individual household. After completion of distribution of ICS the data is transferred in electronic form (excel sheet) at CPA level by CME.</p> <p>The verification team checked the ICS distribution record (End User Agreement) /11/ and ICS registration database/5/. Also, verification team confirmed the same during on site visit for sample households against the entry in End User Agreement/11/ and ICS registration database/5/. Verification team can confirm that the recorded date of distribution of ICS in ICS registration Database/5/ is correctly mentioned.</p> <p>However, CME assumed that some end user may have got the ICS at the end of the day or in late afternoon during distribution to the end user. So, they may not start using the ICS on same day. Hence, consideration of ICS operation date as next day from the date of distribution to end user is considered appropriate and also conservative.</p>

		If applicable, has the reported data been cross-checked with other available data?	Yes. The verification team cross checked the start date and end date of distribution as mentioned in MR/02/ with the dates of ICS distribution as per signed end user agreement for individual ICS/11/ as well as from ICS registration database/5/ during on site visit.
		Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes. The QA/QC procedure are in place, internal checks have been done by the CMR and established during the onsite assessment.
	3.	Data/Parameter, Unit: $\mu_y$ , <b>Fraction</b> Description: Adjustment to account for any continued use of pre-project devices during the year $y$	
		Measuring /Reading /Recording frequency	The monitoring frequency is at least once every two years in the CPA-DDs and PoA-DD. In accordance with the CPA-DDs and PoA-DD/14/ the required confidence level and precision for sampling is 95/10 for annual and 95/5 for biennial sampling.
		Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	The PoA-DD and CPA-DD/14/ allows the monitoring frequency to be annual or biennial provided confidence level and precision are appropriately considered. In the current monitoring period three CPAs are sampled and monitoring frequency is within one year, hence 95/10 confidence level and precision has been considered for annual monitoring at CPA level, which is acceptable considering higher confidence level achieved.
		Monitoring equipment	Not applicable
		Is accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer's specification?	Not applicable
		Is the accuracy valid for the entire measuring range or do different accuracy levels apply to different measuring ranges?	Not applicable
		Calibration frequency /interval:	Not applicable



	Is the calibration interval in line with the monitoring plan and/or methodology? If the monitoring plan does not specify the frequency of calibration, is the selected frequency in accordance with the local/national standards, or as per the manufacturer's specifications?	Not applicable
	Is the calibration of measuring equipment carried out by an accredited person or institution?	Not applicable
	Is(are) calibration(s) valid for the whole reporting period?	Not applicable
	Is the calibration carried out for a measuring range comparable with the range for which measurements have been carried out?	Not applicable
	How were the values in the monitoring report verified?	<p>The value of parameter is calculated based on the results of the sampling survey that was conducted by CME at PoA level across the group of the three CPAs covered in the current monitoring period. The monitoring of this parameter was done through physical check and interviews with end users as part of the monitoring survey performed by the monitoring team using the questionnaire developed by the CME. The survey and sampling practice was demonstrated in the form of survey report and survey data are also submitted in Survey excel file. The survey conducted was found to be in line with the requirement of the page 14 of the applied methodology. As per registered sampling plan, the sampling was conducted as numeric mean value interest for the parameter and then expressed in fraction. The value (i.e. fraction) derived from this sampling survey has been considered as the value for the <math>\mu_y</math> applicable for each CPA. The details of sampling check and precision etc. are discussed below.</p> <p>In all, total 13 samples for the three CPAs (i.e. proportionately from each CPA - 9 samples from CPA1, 2 samples each from CPA 2 and 3) were surveyed by CME. The sample size calculator required a minimum of 11</p>

		<p>samples, which was then rounded up across the CPAs to arrive at final sample size of 13. The calculation for determining the sample size were checked by the verification team and found to be appropriate and consistent with equation in the registered PoA-DD/14/. The numeric mean value sampling formula has been used using 95/10 confidence and precision level.</p> <p>The sampling data and results are verified from the sampling sheet (final sampling sheet, version 03).DOE has referred to the para 24 of the Sampling Standard (ver 07) while reviewing the sampling data and results It was found that the required level of precision i.e. 10% or less has not been achieved at 95% confidence level as mentioned in section E.3.4.3 of this report. Whereas, the selected samples are found to be reasonably representative of the population.</p> <p>Therefore, in line with provision of the para 17(b)(i) and also as per the provision of QA/QC of the registered monitoring parameter, upper bound value has been considered which is found to be more conservative value.</p> <p>However, during the on-site verification, the verification team has visited these samples. None of the pre-project stove (i.e. three stone open firing) found in operating for during the DOE's sampling survey at time of site visit.</p> <p>However, as per CME's sampling survey an adjustment factor for baseline usages has been considered using upper bound value of the confidence interval of the sampling, which is 96.76%. CME has calculated this value (i.e. as the parameter <math>\mu_y</math>) in fractional value derived from the survey data captured during the sampling survey period '24<sup>th</sup> April 2019 to 2<sup>nd</sup> May 2019'. DOE has reviewed the survey data and sampling calculation practice demonstrated under the sampling survey excel file and found to be</p>
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			<p>in accordance with the prescription of the applied methodology (i.e. option 2, page 14 of version 9, AMS II G). The use of sampling related formulae to calculate standard error, intervals and reliability check etc. has been verified with the requirements of the Sampling Guidelines (ver 04) and found to be appropriate.</p> <p>Thus, the value for the parameter <math>\mu_y</math> is 0.9676 which is the adjustment factor applied in the ER calculation, which is found to be the most conservative as value has been derived based on upper bound of the sampling limits and also in comparison to the DOE's onsite survey results.</p> <p>The sampling details and calculations are verified from the "Monitoring Survey-<math>\mu</math>" sheet under the Sampling Sheet, version 03. The analysis of results through sampling precision check formula are rechecked from the "Analysis of results" sheet under the Sampling Sheet excel, version 03. The application of formula and calculation practice is found to be correct and hence accepted. (more details related to this parameter <math>\mu_y</math> are discussed under the section E.3.4.3)</p>	
		<p>If applicable, has the reported data been cross-checked with other available data?</p>	<p>Yes. The survey results/6/ were checked by the verification team and the applied value was found acceptable. The precision of the sampling was not achieved, hence upper bound value has been considered which was the more conservative value in the confidence interval of the sampling. The results are reproducible in the corresponding ER spreadsheet/3/ of final MR/2/.</p> <p>During the on site verification, the verification team randomly selected 18 samples for DOE's field survey and found that zero traditional stoves were operational along with ICS installed, which confirms the CME's sample survey results are also conservative.</p> <p>Moreover, the observation of DOE is that in most of the cases</p>	

		beneficiaries use the project ICS as a preference but there are various circumstances (such as bulk cooking/social events/gathering) that forces them to use an additional cook stove in those instances. But in all cases, the generic daily meals (i.e. avg. 3 times cooking of regular meals per day are being cooked using the project ICS only. The survey presented by CME also confirms to the same.	
	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes. Based on the interaction during on site visit the verification team confirmed that trainings were provided to the staff responsible for collection of data and that the QA/QC procedure are in place.	
	<b>4. Data/Parameter, Unit: <math>N_{d,HH}</math>, Number</b> <b>Description: Number of project devices distributed per household</b>		
	Measuring /Reading /Recording frequency	The data is recorded from start date of ICS distribution 09/10/2018 up to 31/05/2019, which is the end date of the current monitoring period as verified from the ICS distribution in ICS registration database/5/.	
	Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes. It is in line with the PoA-DD and CPA-DDs.	
	Monitoring equipment	Not applicable	
	Is accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer's specification?	Not applicable	
	Is the accuracy valid for the entire measuring range or do different accuracy levels apply to different measuring ranges?	Not applicable	
	Calibration frequency /interval:	Not applicable	
	Is the calibration interval in line with the monitoring plan and/or methodology? If the monitoring plan does not specify the frequency of calibration, is the selected frequency in accordance with the local/national standards, or as per the manufacturer's specifications?	Not applicable	

	Is the calibration of measuring equipment carried out by an accredited person or institution?	Not applicable
	Is(are) calibration(s) valid for the whole reporting period?	Not applicable
	Is the calibration carried out for a measuring range comparable with the range for which measurements have been carried out?	Not applicable
	How were the values in the monitoring report verified?	<p>The minimum value can be 1 e.g., for only one ICS provided to each household.</p> <p>The verification team has verified the same through the interview with Individual households during DOE on site visit. Moreover, the unique serial numbers of the ICS are verified against the distribution database and also from the copies of registration card available with the households, which confirms that only one ICS has been provided to each household under the CPAs. The verified results are included in the final MR/2/ and corresponding ER spreadsheet/3/.</p>
	If applicable, has the reported data been cross-checked with other available data?	Yes. All the input values used to calculate this parameter were cross-checked by verification team against ICS registration database/5/ any similar names and address appearing for more than 1 ICS number.
	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes. Once the ICS is distributed to the beneficiary it is registered into respective ICS registration database. The spot checks were regularly conducted by CME through the ground team in order to correct the ICS registration database, if required or as may be appropriate. During the site visit the ICS distribution process, record keeping (distribution dates) and process of spot check were reviewed and were found reliable.
<p>5. Data/Parameter, Unit: <math>\eta_{\text{new},i,j}</math>, <b>Fraction</b>          Description: Efficiency of the project device of each type <i>i</i> and batch <i>j</i></p>		
	Measuring /Reading /Recording frequency	The efficiency of project device was calculated following Water Boiling Test protocol 4.2.4/22/ based on approach 3 of Data/Parameter of the applied methodology, version 09/18/

	Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes. As per CPA-DDs/14/. The Stove technology provider is a reputed organization (Tandavanala) in Madagascar and also the stove design and quality is tested by CNRIT Lab, Department of Energy, Madagascar. Therefore, approach 3 of Data / Parameter table 11 of applied methodology /18/ can be applied for the monitoring of efficiency of the project device.
	Monitoring equipment	<p>The WBT tests were coordinated by the CME and undertaken following the requirements of WBT protocol 4.2.4/22/ by experienced professional and team which were trained/20/ to conduct WBT. The tester is a Researcher at the National Centre for Industrial and Technological Research, having 30 years of work experience in the field of Thermal Energy &amp; Industrial processes. Thus, the WBT tests were conducted by credible and experienced professional who represents the third party.</p> <p>The PoA-DD or CPA-DD do not prescribe any specific monitoring equipment but weighing scale, digital moisture meter and digital thermometer were required and used to conduct WBT. The detail is provided under Section E.3.4.4 of this report.</p>
	Is accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer's specification?	Yes. Please refer Section E.3.4.4 of this report.
	Is the accuracy valid for the entire measuring range or do different accuracy levels apply to different measuring ranges?	Yes. Please refer Section E.3.4.4 of this report.
	Calibration frequency /interval:	Please refer Section E.3.4.4 of this report
	Is the calibration interval in line with the monitoring plan and/or methodology? If the monitoring plan does not specify the frequency of calibration, is the selected frequency in accordance with the local/national standards, or as per the manufacturer's specifications?	Please refer Section E.3.4.4 of this report
	Is the calibration of measuring equipment carried out by an accredited person or	Please refer Section E.3.4.4 of this report

	institution?	
	Is(are) calibration(s) valid for the whole reporting period?	Please refer Section E.3.4.4 of this report
	Is the calibration carried out for a measuring range comparable with the range for which measurements have been carried out?	Please refer Section E.3.4.4 of this report
	How were the values in the monitoring report verified?	The reported values were checked with the actual WBT results obtained from test conducted in CNRIT Lab, Department of Energy, Madagascar/6/ and filled in Data Sheets (for this purpose) and were found consistent. Total 13 samples were considered for WBT (9 ICS from 1 <sup>st</sup> CPA, and 2 each from CPA 2 & 3) and the WBT results were conducted three times for all 13 stoves. The sample survey approach is included under Section E.3.4.3 of this report. The verified value is 31.5% which is found to be conservative and in acceptable range.
	If applicable, has the reported data been cross-checked with other available data?	<p>Yes. The data has been cross-checked with the estimated efficiency in the registered CPA-DD/14/. The actual efficiencies in this monitoring period were slightly lower compared to the values considered in CPA-DD/14/. Since, the values are based on actual WBT tests conducted at standard laboratory conditions and therefore considered acceptable.</p> <p>Moreover, for the purpose of internal check and better judgement of ICS efficiency, DOE has conducted WBT on one of the samples (i.e. one operational stove) during the site visit to households. The results of the WBT conducted on site was found to be 35%/25/, which is more than the weighted average value considered by CME (i.e. 31.5%) during the sample WBT test. Thus, the reported value has been cross-checked and found to be conservative.</p>
	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes. Based on the interaction during on site visit the verification team confirmed that trainings were provided to the staff responsible for conducting the WBT and that the QA/QC procedure is in place. WBT Protocol Version 4.2.4/22/ was applied, which is acceptable.

6. One of the monitoring parameters “**Date of commissioning of batch j**” as mentioned in the CPA-DD/14/ was not monitored by CME, since CME considered date for commissioning for each individual ICS in ER Calculation rather than single date for commissioning for batch of ICS. This is in line with the applied methodology AMS-II.G., version 09, which states that CME may opt to group the devices in batches and the latest date of commissioning of a device within the batch shall be used as the date of commissioning for the

	<p>entire batch. However, CME opted to report the date of commissioning of each project device separately which is reported via monitoring parameter "Date of commissioning of project device i". Same is explained above in detail.</p> <p>Moreover, from the on-site visit DOE confirms that the production of particular type of ICS (i.e. Sao-Rehitra) is a continuous process, there is no batch-wise production. Similarly distribution of stoves are also a continuous process however there are different numbers of stoves distributed in each month which can be counted from the distribution database (also from the user's agreement copies). Therefore, start date of accounting of emission reductions for stoves distributed in a particular month has been considered as the next day of the last date of stove distribution for that month. This is the most conservative approach and hence justifies the particular parameter.</p>
<b>Findings</b>	CL-01 has been raised in this context. Refer Appendix 4 of this report for detailed finding.
<b>Conclusion</b>	Corresponding to the §346 of CDM VVS for PoA, V2/17/, the verification team confirm that the monitoring has been carried out in accordance with the registered PoA-DD/14/ and CPA-DD/14/. The monitoring system follows the information flow for the parameters as mentioned in monitoring plan in registered PoA-DD and registered CPA-DD/14/. The monitored data for the parameters has been verified by checking the procedure for information flow and found to be complete and consistent with registered CPA-DD/14/.

### E.3.4.3. Implementation of sampling plan

<b>Means of verification</b>	<p>The monitoring has been carried out in accordance with the monitoring plan contained in the PoA-DD/14/ and respective CPA-DDs/14/.</p> <p><b>Sampling Design/Target Population/Sampling Frame/Reliability:</b> A Simple Random Sampling technique has been used, which is in line with the monitoring plan of the PoA-DD (Section I.7.2)/14/ as referred in the respective CPA-DDs/14/. In this sampling design all the three CPAs(i.e. CPA-0001, 0002 &amp; 0003) that were implemented under the current monitoring period was subjected. The sampling frame can consider confidence level and precision as 95/10 for annual and 95/5 for biennial sampling survey in order to meet the requirement of Standard/23/. CME has applied 95/10 for sampling option. Each ICS had the equal chance of selection.</p> <p><b>Sampling Method:</b> As per the provision of registered sampling plan, the simple random sampling method has been considered. Thereafter, ICS/households present in various townships were randomly selected using an online Randomizer as per the outcome of sampling size calculation for respective parameter and the total sample size has been proportionately broken up for each CPAs considering the ratios of ICS distributed under the CPAs. Since the ICSs are of same type, age group and the end beneficiaries are homogenous (i.e. baseline with three stone open fire) therefore, simple random sampling is justified. Approach is unbiased and reliable.</p> <p><b>Sample Size (Required and Actual) for Parameter of Interest:</b> The sampling is applied to the following monitoring parameters:  <math>N_{y,i,j}</math>: Number of project devices of type i and batch j operating during year y  <math>\mu_{y,i,j}</math>: Adjustment to account for any continued use of pre-project devices during the year y  <math>\eta_{new,i,j}</math>: Efficiency of the project device of each type i and batch j</p> <p>The representative sampling has been undertaken as part of a PoA-wide Sampling Plan (by grouping and sampling across the three CPAs) that is designed in line with the requirements of the "Sampling and surveys for CDM project activities and programme of activities", version 04. The minimum sample size for each monitoring</p>
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parameter has been calculated based on 95/10 confidence/precision which suffices for annual sampling.

The sample size calculation has been verified from the “Sample Size Calculation-final” sheet under the Sample Size excel sheet, final version 03.

The procedure to determine the sample of households will ensure that they adequately represent the broader project population, minimizing sampling error.

The sample size was determined for the total population of stoves for the ex—post monitoring parameters -  $N_{y,i,j}$ , and  $\mu_{y,i,j}$  which are survey parameters. Also, efficiency of the project ICS( $\eta_{new,i,j}$ ) is a measured monitoring parameter, which was calculated based on sampling Water Boiling Tests (WBT).

$N_{y,i,j}$  : Visual inspection of the premises to see if ICS is operational and in use. Interview with end user if required to verify that ICS is still in use (Yes/No)

Hence the survey was designed and data collected accordingly.

$\mu_{y,i,j}$ : Pre project device only is in use then fraction to be used to calculate total number, however if pre project device is used along with project ICS, proportion of usage of each will be determined by cooking habits evaluated by survey questionnaire during the monitoring period.

Hence the survey was designed and data collected accordingly. Here, option 2 of the page 14 of the applied methodology has been referred and sampling survey was designed in line with the same.

Using the formulas as given in the section “Sample Size” in registered sampling plan of the PoA-DD, the CME has randomly sampled the required number of ICS from the primary sampling units.

For the parameter “ $N_{y,i,j}$ ” the resulting sampling size for a 95/10confidence/precision is calculated for the total population size, which comes out to be

$$n \geq \frac{1.96^2 N \times p (1-p)}{(N-1) \times 0.1^2 \times p^2 + 1.96^2 \times p (1-p)}$$

Where:

n = Sample size

N = Population size (Total number of households/ICS)

p = Expected proportion

1.96 = Represents the 95% confidence required

(In the case of 90% confidence, 1.645 shall be used)

0.1 = Represents the 10% relative precision

$$n \geq 42.55$$

$$n = 43$$

(the calculation has been checked from the sample size calculation excel sheet /4/ submitted by CME and is found to be correct)

However, since the total population is combination of three CPAs, therefore the sample size of the sample frame is proportionately distributed for each CPA and rounded up values have been considered which resulted a total sample size of 44, wherein 34 samples accounted from CPA 1 and 5 samples accounted from each of CPA 2 and 3. The calculation of sample size has been verified from the sample survey sheet.

Similarly, for the other parameter  $\mu_{y,i,j}$ , the resulting sampling size for a 95/10confidence/precision is calculated for the total population size, which comes

out to be  
 $n \geq 4$ , i.e.  $n = 4$ .

Since the calculated sample size was found to be less than 30, therefore, CME has applied tDistribution to have an adjusted sample size. After applying the tDistribution, the adjusted sample size is found to be 11. Therefore, in this case a sample size of 11 is supposed to be sampled from the primary sampling unit. However, since the total population is combination of three CPAs, therefore the sample size of the sample frame is proportionately distributed for CPAs and rounded up values have been considered which resulted a total sample size of 13, wherein 9 samples accounted from CPA 1 and 2 samples accounted each from CPA 2 and 3. The calculation of sample size has been verified from the sample survey sheet.

Similarly, the required sample size calculation has been conducted for the parameter,  $\eta_{new}$ . Since sample size calculated was below 30, so tDistribution has been applied to adjust the sample which has resulted into a sample size of 13, wherein 9 samples accounted from CPA 1 and 2 samples accounted each from CPA 2 and CPA 3. For details please refer the sample survey sheet.

Thus, the sample size finalized for all the three parameters are as follows:

Parameter	Sample size calculated
$N_y (= N_{y,i,j})$	44
$\mu_y (= \mu_{y,i,j})$	13
$\eta_{new} (= \eta_{new,i,j})$	13

Currently, only single type of ICS technology selected (i.e. Sao-Rehitra wood stove) across the three CPAs and distribution is also continuous and are also homogeneous, hence  $i, j$  both the nominations same.

The sample size calculation spreadsheet/4/ was checked and found correct as per registered monitoring plan mentioned in CPA-DD/14/.

#### Sample selection:

The CME has considered selection of samples based on Random selection; and for such random selections an online randomizer has been used (<https://www.randomizer.org/>). Also, in order to confirm the random selection based on this online randomizer, the screen shoots of the randomizer website at the point of random result generation were kept for references. The same samples which were generated by the randomizer were considered for monitoring survey and testing. DOE has checked the copies of the survey forms submitted by CME which are further crosschecked with the "sample selection" sheet under the Sampling Sheet excel, version 03, to confirm that the same samples were surveyed/tested during the monitoring survey conducted for this verification.

The random sample selection has been verified by the verification team from the sample size calculation sheet/4/. The samples were drawn from the complete ICS registration databases. The same is found to be justified and appropriate. Hence the verification team able to confirm that the samples are representative of the total population.

Based on interviews with the CME and surveyors during the site visit, in addition to simply asking this question to the end users, the surveyors were also trained to visually inspect the stoves to corroborate the responses received. Therefore, the implementation of survey was considered reliable.

#### Survey Results:

**For parameter  $N_y$ :** As confirmed from the sampling survey sheet/4/, the survey was done based on visual inspection of the premises to see if project ICS is operational and in use. During Interview with end users, the presence of ICS and its unique numbers were physically verified. This is a proportional parameter, hence sampling

is done using proportional sampling formula as prescribed under the registered sampling plan.

**For parameter  $\mu_y$ :** As confirmed from the sampling survey sheet (final version 03)/4/, the CME has designed the survey by adopting sampling approach in accordance with the page option 2 of the page 14 of the applied methodology, as per the provision of Sampling Standard and also the sampling Guideline, which is also in line with the monitoring section of the registered PoA-DD. This parameter " $\mu_y$ " included in the registered PDD is a fractional value parameter, in line with the applied methodology, version 09. Therefore, the value for  $\mu_y$  needs to be expressed in fraction from the sampling survey. Thus, the fractional value of the monitoring parameter ( $\mu$ ) has been derived from the absolute value (i.e. kg/day) of the surveyed data and estimated proportion is expressed relative to the baseline consumption ( $B_{old}$  in kg/day). The absolute value of  $\mu$  (i.e. kg/day, of the samples where continuous usage of baseline stove is identified) expressed as proportion to the equivalent value of  $B_{old}$  (i.e. kg/day) which is representative of the entire population. The CME has submitted the sampling survey excel, with detailing of the calculation practice from the survey data and also the rational/justification of the same.

**For parameter  $\eta_{new}$ :** As confirmed from the sampling survey sheet/4/, the result of this parameter was drawn based on the Water Boiling Test (WBT) conducted on the selected samples.

#### Reliability and precision calculation:

The verification team has verified the Sampling Survey Sheet (final version 03)/4/ where monitored data, calculations and the actual achieved precision is calculated against the Sampling Guidelines (version 04) and as per the requirements of the "Standard for sampling and surveys for CDM project activities and programme of activities" (version 07)/23/. The verification team has reviewed the final Sampling Sheet (version 03) w.r.t. the appropriateness of use of formulae for checking reliability of the sampling results against the expected precision. The application of formulae and presentation of results are found to correct.

The verification team has confirmed from the Sampling sheet (final version 03)/4/ that the required precision was kept <10% during sample size calculation for each type of stove for each vintage. The reliability check confirmed that the precision is within the desired range for the two parameter  $N_y$  &  $\eta_{new}$ , whereas for  $\mu_y$  the achieved precision is beyond the required precision of 10%. Therefore, the lower bound value has been considered for the particular parameter  $\mu_y$ . The verification team has further verified this approach as per the QA/QC procedure registered for the parameter and also as per the para 83 of the Appendix 4 of the Sampling Guideline (ver 4) and the Para 17(b)(i)a of the Sampling Standard (ver 7). The calculation of lower & upper bound value and selection of upper bound value as result has been found to be more conservative, hence appropriate and acceptable. The same has been verified from the "Monitoring Survey- $\mu$ " sheet & "Analysis of results" sheet in the Sampling Survey excel file (ver 03, dated 12 May 2020). The details are also demonstrated under the Appendix 4 of the MR (ver 03.1, dated 14 May 2020).

The equation used for reliability check:

$$\frac{\frac{1}{2}\text{width of confidence interval}}{\text{proportion}} \times 100\%$$

Where sample equation used is based on proportional value, the width of the

confidence interval has calculated using the formula:

$$p \pm 1.96 \times \sqrt{1 - \frac{n}{N}} \times \sqrt{\frac{p(1-p)}{n}}$$

This equation is applicable for the parameter  $N_y$ .

Whereas, when mean value (i.e. 'sample mean') and 'standard deviation' (SD) are used in sampling, the confidence interval has been calculated using the formula:

$$\text{Sample Mean} \pm t_{(n-1)} \times \sqrt{1 - \frac{n}{N}} \times \frac{SD}{\sqrt{n}}$$

This equation is applicable for the parameters  $\mu_y$  and  $\eta_{\text{new}}$ .

In both the equations, the 'Standard Error' is referred by the section respectively as follows:

$$\sqrt{1 - \frac{n}{N}} \times \sqrt{\frac{p(1-p)}{n}} \quad \text{and} \quad \sqrt{1 - \frac{n}{N}} \times \frac{SD}{\sqrt{n}}$$

Where:

n = Sample size

p = sample proportion

N = Population size

1.96 = Represents 95% confidence required

SD = Standard Deviation

Here,  $t_{(n-1)}$  represents the relevant value from the t-distribution with (n-1) degrees of freedom that is associated with the confidence.

The summary of the results are provided below:

The results for calculations are reproduced, as an example, in the table for parameter  $N_{y,i,j}$  as follows –

Table – Sample size calculation prior to survey

Parameter	Value	Source/ basis
Population Size	22563 <sup>#</sup>	ICS registration database (Number of stoves registered in database till 31/05/2019)
Sample Size	44 <sup>*</sup>	Calculated value by CME for sample size calculation.

\*Apart from the 44 samples, the another 13 samples where  $\mu_y$  parameter was surveyed were also checked for  $N_{y,i,j}$ , thus, altogether 57 samples were made available by CME in the sampling survey. And all these samples were found to be operational.

<sup>#</sup>Here the total population size considered by CME at the time of conducting the sampling monitoring survey (i.e. 24/04/2019 to 02/05/2019) was 17380, as by that time the distribution of stoves for the month of April and May was not completed. Whereas, by the end of the monitoring period (i.e. as on 31/05/2019) a total of 22,563 ICS was distributed, thus the final population size is 22,563. As verified, the minimum sample size required with total population size of 22,563 is also same as that was calculated for 17380. Hence acceptable.

The following table represents precision achieved after the survey, as an example, for the same parameter of interest (i.e.  $N_{y,i,j}$ ) discussed above.

Parameter	Value	Source/ basis
N (Model SR wood stove)	44	Actual sample size surveyed
Overall Proportion	1.00	Actual value
Confidence Level (Z-value)	1.96	95% confidence level
Precision achieved	0.0%	Calculated
Is required precision achieved?	Yes	< 10%

In the same manner, all parameters of interest are included in the Sample Size Calculation spreadsheet/4/. These were checked for the input values as well as formula applied and were found consistent. The reliability (demonstration of precision achieved after the survey results) is depicted in the Sample Size Calculation Spreadsheet/4/ corresponding to final Monitoring Report/2/, which were also found correct. First monitoring survey for this monitoring for parameters  $N_{y,i,j}$  and  $\mu_y$ ; and also the parameter  $\eta_{new,i,j}$  was conducted from 24/04/2019 to 02/05/2019/6/.

Table – Actual Precision Achieved based on Survey results:  
(Ref: “Sampling Sheet (PoA10443)\_1st Ver\_revised ver03-Final(May2020)”)

Monitoring Parameter	Precision Achieved	Is required Precision achieved? (< 10%)
$N_{y,i,j}$	0%	Yes
$\mu_{y,i,j}$	21.24%	No, upper bound value used which is more conservative.
$\eta_{new,i,j}$	4.88%	Yes

The sampling calculation, survey data, results and reliability check etc. are properly demonstrated under the sampling survey excel file (final ver 03, 12 May 2020)/4/. Based on the verified results the verification team found that the required precision is calculated and/or justified in line with the requirements, in all the cases; and therefore the survey results/4/ were directly used in the calculation of ERs.

**The results derived from the sampling survey for all the three monitoring parameters are as follows:**

Parameter	Results	Reliability Check / Precision Achieved
$N_y (= N_{y,i,j})$	100%	Yes
$\mu_y (= \mu_{y,i,j})$	96.76%	No, ‘Upper bound value’ used which is the more conservative value.
$\eta_{new} (= \eta_{new,i,j})$	31.50%	Yes

Also, the verification team has verified the sampling calculation, results and precision derived from the sampling etc. against the requirements of the Sampling Standard (version 07) and also referred to “Best Practice Example” in the Sampling Guidelines (version 04). The overall sampling practice, results and precisions etc. are found to be in line with the required specifications. Further, the verification team has cross checked the survey input values from the primary survey forms which were made available to DOE during the on-site audit. The input values from the survey for the respective monitoring parameters are found to be consistent, no discrepancy observed, the required confidence/precision has been met; and the selected samples were representative of the population. This has also fulfilled the requirement of the para 24 of the sampling standard (version 7).

For the two parameters  $N_y$  &  $\eta_{new}$  required precisions are achieved, whereas for the parameter  $\mu_y$  precision is outside the required range of 10%. Therefore. CME has

	<p>calculated the width of the confidence interval and lower bound value has been considered, which is found to be most conservative approach, as verified from the "Monitoring Survey-<math>\mu</math>" spreadsheet under the Sampling sheet excel, version 03.</p> <p><b>Conservativeness:</b> The final Sampling sheet (version 03) also includes demonstration of the lower and upper bound values for the parameter <math>\mu_y</math> by using numeric mean value (kg/day) of the sampling which is then expressed in fraction (as verified from the "Monitoring Survey-<math>\mu</math>" sheet under the Sampling sheet, ver 03); This approach is in line with the para 17(b)(i)a of the Sampling Standard and here Upper bound value is coming out to be more conservative.</p> <p>Additionally, DOE has further reviewed this approach as per para 17(C) of the Sampling Standard and found to be appropriate as this is the first verification at PoA level and is within the first two years of the start of the crediting period, which fulfils the requirement of para 17(c) of the Sampling Standard.</p>
<b>Findings</b>	No finding has been raised.
<b>Conclusion</b>	The sample size selected confirms the desired 95% level of confidence and with a 10% margin of error. CME has submitted the sampling calculation, survey results and detailed calculation sheet which has been verified by assessment team and found to be acceptable. The application of sampling formula, selection of samples, calculation of precision etc. are found to be correct and in line with the requirements of the sampling guideline and standard. Hence, the sampling survey carried out by CPA implementer is in accordance with §24 of Standard for "Sampling and surveys for CDM project activities and programmes of activities" (version 07)/23/.

### E.3.5. Compliance with the calibration frequency requirements for measuring instruments

<b>Means of verification</b>	<p>The registered monitoring plan (of respective CPA-DD and PoA-DD/14/) does not state the calibration requirements for any of the parameter. However, as good practice, the verification team enquired information with regard to monitoring equipment viz., weighing scale and thermometer that were used to conduct the parameter "Efficiency of the project device of each type <i>i</i> and batch <i>j</i>". As a result, following information was verified:</p> <table border="1"> <thead> <tr> <th>Instrument</th><th>Specifications</th></tr> </thead> <tbody> <tr> <td>Electronic Scale</td><td> <ul style="list-style-type: none"> <li>✓ Colour: Silver &amp; White</li> <li>✓ Dimension: 370 X 130 X 360 mm</li> <li>✓ Weight : 97.81 oz/2773g</li> <li>✓ Material : plastic &amp; Iron sheet</li> <li>✓ Model: ACS-30</li> <li>✓ Capacity: 30kg to 40 kg (max)</li> <li>✓ Division: 5g</li> <li>✓ Graduation: 5g</li> <li>✓ Make Year: 2017</li> <li>✓ Last Calibration status: March 2019</li> <li>✓ Validity: Annual</li> </ul> </td></tr> <tr> <td>Thermometer</td><td> <ul style="list-style-type: none"> <li>✓ °C select</li> <li>✓ Hold function</li> <li>✓ With tubular case</li> <li>✓ Display type : Digital display providing accurate and clear indication</li> <li>✓ Material : Stainless steel &amp; ABS</li> <li>✓ Temperature measure range : -50°C – 300° C</li> <li>✓ Temperature measurement accuracy : ±1degree</li> <li>✓ Probe length : 14.8cm</li> <li>✓ Make Year: 2017</li> <li>✓ Last Calibration: March 2019</li> <li>✓ Validity: Annual</li> </ul> </td></tr> <tr> <td>Thermo-Hygrometer</td><td>✓ Measurable Temperature Range : -50c ~ +70c ;</td></tr> </tbody> </table>	Instrument	Specifications	Electronic Scale	<ul style="list-style-type: none"> <li>✓ Colour: Silver &amp; White</li> <li>✓ Dimension: 370 X 130 X 360 mm</li> <li>✓ Weight : 97.81 oz/2773g</li> <li>✓ Material : plastic &amp; Iron sheet</li> <li>✓ Model: ACS-30</li> <li>✓ Capacity: 30kg to 40 kg (max)</li> <li>✓ Division: 5g</li> <li>✓ Graduation: 5g</li> <li>✓ Make Year: 2017</li> <li>✓ Last Calibration status: March 2019</li> <li>✓ Validity: Annual</li> </ul>	Thermometer	<ul style="list-style-type: none"> <li>✓ °C select</li> <li>✓ Hold function</li> <li>✓ With tubular case</li> <li>✓ Display type : Digital display providing accurate and clear indication</li> <li>✓ Material : Stainless steel &amp; ABS</li> <li>✓ Temperature measure range : -50°C – 300° C</li> <li>✓ Temperature measurement accuracy : ±1degree</li> <li>✓ Probe length : 14.8cm</li> <li>✓ Make Year: 2017</li> <li>✓ Last Calibration: March 2019</li> <li>✓ Validity: Annual</li> </ul>	Thermo-Hygrometer	✓ Measurable Temperature Range : -50c ~ +70c ;
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Thermo-Hygrometer	✓ Measurable Temperature Range : -50c ~ +70c ;								

	(Temptec 4 In 1)	-58°F ~ +158°F ( C/F selectable) ✓ Relative Humidity Measure Range : 20%~90% ✓ 3meter external outdoor sensor cord ✓ Clock Function ✓ Foldable Stand & Wallmountable ✓ Lcdsize : 41mm x 60mm ✓ Make Year: 2019 ✓ Calibration: NA (new device)
	Pot (Ambatolampy)	✓ Depth : about 11cm ✓ Ø : about 24cm ✓ Thickness : about 0.7cm ✓ Weight : about 700gr to 750gr ✓ Material : ferrous allumino ✓ Calibration: NA
	Tape Measure	✓ the measuring range is 60 inches/ 150 cm (dual sided), ✓ Easy to read ✓ Good sewing tool: a flexible measuring tape ✓ Calibration: NA
<p>All equipment's were used between 24/04/2019 to 02/05/2019 i.e., which is after the calibration of the respective equipment (as applicable) and therefore it can be stated that these were in worthy state of use at the time of WBT.</p> <p>CME has submitted the certified copy/08/ of the list of equipment along with the calibration details confirming the method and protocols used for WBT. The specifications of equipment establish that the results are reliable. Therefore, appropriate QA/QC procedures have been followed for the monitoring parameters under discussion.</p>		
<b>Findings</b>	CL#1 has been raised in this context. Refer Appendix 4 of this report for detailed finding.	
<b>Conclusion</b>	The verification team confirm that CME applied good practices (as per manufacturer recommendation) while using the monitoring equipment and these were under the state of calibration. There is no specific requirement prescribed in this regard in the registered monitoring plan of monitoring methodology. However, CME used calibrated instruments and use of such instruments and method of conducting WBT are properly documented and further certified by the CNRIT Lab. Therefore, the approach presented by CME was accepted.	

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

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

<b>Means of verification</b>	<p>The following equations were used to determine the baseline emissions as provided in the monitoring report /2/ and applied in the corresponding ER sheet /3/. The expressions used were found consistent with the registered PoA-DD/14/ and CPA-DDs/14/ and the applied methodology AMS-II.G., Version 09/18/:</p> $ER_y = \sum_i \sum_j ER_{y,i,j} - LE_y$ <p>Where:  <i>i</i> = Indices for the situation where more than one type of project device is introduced to replace the pre-project devices.  <i>j</i> = Indices for the situation where there is more than one batch of project device</p> <p>ER<sub>y</sub> = Emission reductions during year <i>y</i> in t CO<sub>2</sub>e  ER<sub>y,i,j</sub> = Emission reductions by project device of type <i>i</i> and batch <i>j</i> during year <i>y</i> in t CO<sub>2</sub>e  LE<sub>y</sub> = Leakage emissions in the year <i>y</i></p> <p>In the existing CPAs, only one type of project stove is distributed where there is no batch wise variation. Hence nomination of <i>i</i>, <i>j</i> is not considered further.</p>
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$$ER_y = B_{y,saving} \times N_y \times f_{NRB,y} \times \mu_y \times N_{CV_{biomass}} \times EF_{projected\_fossilfuel}$$

Where, parameters used in the formulae are already explained under the section E.1 & E.2.

#### Determination of $B_{y,savings,i,j}$

In line with para 18 of applied approved methodology AMS-II.G version 09.0, four option given to determine  $B_{y,saving,i,j}$ . Here CME has chosen option three i.e. Water Boiling Test (WBT) with corresponding formula given below:

$$B_{y,savings,i,j} = (B_{old,i}) * L_y * (1 - \eta_{old}/(\eta_{new,i,j})).$$

The above equation has been used for CPAs as only one stove per household has been distributed, which can be cross checked from the stove distribution database.

The baseline saving shall be determined as:

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

$N_{d,HH}$  = Number of project devices per household (number), which is 1.

All the three CPAs included under the PoA are based on wood fuel. Therefore, above equation is suitable. The detailed ER calculations are submitted in the ER sheet which has been verified by DOE and found to be in line with the registered PoA-DD and respective CPA-DDs.

It is confirmed that all the stoves distributed under the three CPAs has been categorized under the same vintage. This is summarized in the table below;

Vintage (Type)	Cut-off date/3/ (Installation Date of ICS)	Remarks
Vintage 1	Between 09/10/2018 to 31/05/2019	From the date of first distribution/registered ICS which is less than a year old.

It has been verified that the corresponding ER sheet/3/ to the final Monitoring Report/2/ has considered the number of stoves which are under the same vintage and accordingly the efficiency of the stoves (i.e. in the ER calculation) are for the same vintage.

#### Findings

No finding has been raised.

#### Conclusion

The verification team confirms that -

- A complete set of data for the monitoring period was available and the verification of each monitoring parameter is elaborated under Section E.3.4.2 of this report. The complete monitoring data is also presented in the corresponding ER sheet /3/ of final Monitoring Report /2/;
- As indicated above, the description about cross-check of reported data is included under respective parameter (refer Section E.3.4.2 of this report);
- Appropriate methods and formulae for calculating baseline GHG emissions or baseline net GHG removals were followed;
- All assumptions used in the emission calculations were found appropriate and therefore justified;
- Appropriate emission factors, IPCC default factors and other reference values were correctly applied. This has also been elaborated under Section E.3.4.1 of this report;
- There is no pro-rate approach (§360(e) of CDM VVS for PoA V2/17/) was



	applied in the current monitoring period as entire monitoring period falls into period that is after the end of first commitment period of Kyoto Protocol.
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### E.3.6.2. Calculation of project GHG emissions or actual net GHG removals by sinks

<b>Means of verification</b>	The PoA-DD/14/, CPA-DD/14/ and applied monitoring methodology/18/ does not prescribe any project emissions to be considered. The onsite visit and project design also did not reveal any potential source to be considered in this regard.
<b>Findings</b>	No finding has been raised.
<b>Conclusion</b>	No additional project emissions calculation were required in accordance with the methodology AMS-II.G, Version 09/18/.

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

<b>Means of verification</b>	<p>In accordance with §29 of applied methodology/18/, the “<i>Leakage related to the non-renewable woody biomass saved by the project activity shall be assessed based on ex post surveys of users and the areas from which this woody biomass is sourced (using 90/30 precision for a selection of samples). The potential source of leakage due to the use/diversion of non-renewable woody biomass saved under the project activity by non-project households/users that previously used renewable energy sources shall be considered. If this leakage assessment quantifies an increase in the use of non-renewable woody biomass by the non-project households/users, that is attributable to the project activity, then <math>B_{old,,}</math> is adjusted to account for the quantified leakage. Alternatively, <math>B_{y,savings,i,j}</math> is multiplied by a net to gross adjustment factor of 0.95 to account for leakages, in which case surveys are not required.</i>”</p> <p>CME has multiplied <math>B_{y,savings,i,j}</math> by a net to gross adjustment factor of 0.95 to account for leakages. Therefore,</p> <p><b>ER<sub>y</sub> = <math>B_{y,saving}</math> x <math>N_{y,x}</math> <math>f_{NRB,y}</math> <math>\mu_{y,x}</math> <math>N_{CV}</math> <math>b_{biomass}</math> <math>EF_{projected\_fossilfuel}</math></b></p> <p>Where,</p> <p><b><math>B_{y,savings,i,j} = (B_{old,i}) * L_y * (1 - \eta_{old}/(\eta_{new,i,j}))</math>.</b></p> <p>Here, <math>L_y = 0.95</math>.</p>
<b>Findings</b>	No finding has been raised.
<b>Conclusion</b>	<p>The verification team confirms that -</p> <ol style="list-style-type: none"> <li>A complete set of data for the monitoring period was available and the verification of each monitoring parameter is elaborated under Section E.3.4.2 of this report. The complete monitoring data is also presented in the corresponding ER sheet /3/ of final Monitoring Report /2/;</li> <li>As indicated above, the description about cross-check of reported data is included under respective parameter (refer Section E.3.4.2 of this report);</li> <li>Appropriate methods and formulae for calculating leakage GHG emissions were followed;</li> <li>All assumptions used in the emission calculations were found appropriate and therefore justified;</li> <li>Appropriate emission factors, IPCC default factors and other reference values were correctly applied. This has also been elaborated under Section E.3.4.1 of this report;</li> <li>There is no pro-rate approach (§360(e) of CDM VVS for PoA V2/17/) was applied in the current monitoring period as entire monitoring period falls into period that is after the end of first commitment period of Kyoto Protocol.</li> </ol>

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

<b>Means of verification</b>	As elaborated above, the emission reductions from the PoA were based on baseline emissions minus leakage emissions. The calculations presented in this
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	<p>regard in the final monitoring report /2/ and corresponding ER sheet /3/ were found appropriate and complying with the provisions prescribed in the registered monitoring plan of respective CPA-DD/14/, PoA-DD/14/ and applied methodology/18/.</p> <p>The verification team confirms that an audit trail that contains the evidence and records that validated the stated figures were checked and found acceptable.</p>
<b>Findings</b>	No finding has been raised.
<b>Conclusion</b>	<p>The verification team confirms that:</p> <ul style="list-style-type: none"> <li>a) The complete data was available and is duly reported;</li> <li>b) As indicated above, the description about cross-check of reported data is included under respective parameter (refer Section E.3.4.2 of this report);</li> <li>c) Appropriate methods and formulae for calculating baseline GHG emissions or baseline net GHG removals, project emissions and leakage emissions were followed;</li> <li>d) Appropriate emission factors, IPCC default factors and other reference values were correctly applied;</li> <li>e) There is no pro-rate approach (§360(e) of CDM VVS for PoA V2/17/) was applied in the current monitoring period as entire monitoring period falls into period that is after the end of first commitment period of Kyoto Protocol.</li> <li>f) The total number of ERs achieved during the current monitoring period is 16,365tCO<sub>2</sub>e.</li> </ul>

Title and UNFCCC reference number of the CPA	Baseline emissions or baseline net GHG removals by sinks (tCO <sub>2</sub> e)	Project emissions or actual net GHG removals by sinks (tCO <sub>2</sub> e)	Leakage (tCO <sub>2</sub> e)	GHG emission reductions or net GHG removals by sinks (tCO <sub>2</sub> e)		
				Amount achieved before 1 January 2013	Amount achieved from 1 January 2013	Amount achieved in the entire monitoring period
<b>CPA 10443-P1-0001-CP1:</b> Madagascar Improved Cookstove Project by KCM-Wood#CPA-W-001	13,721	0	0	0	13,721	<b>13,721</b>
<b>CPA 10443-P1-0002-CP1:</b> Madagascar Improved Cookstove Project by KCM-Wood#CPA-W-002	1,376	0	0	0	1,376	<b>1,376</b>
<b>CPA 10443-P1-0003-CP1:</b> Madagascar Improved Cookstove Project by KCM-Wood#CPA-W-003	1,268	0	0	0	1,268	<b>1,268</b>
<b>Total</b>	16,365	<b>0</b>	<b>0</b>	<b>0</b>	16,365	<b>16,365</b>

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

<b>Means of verification</b>	The verification team has checked the method to compare actual and estimated ex-ante emission reduction. As verified and evident from the section F.5.1 of final Monitoring Report (version 03.1)/2/, the actual emission reductions achieved (16,365 tCO <sub>2</sub> e) by the three CPAs is included in the current monitoring period is found much lesser than the ex-ante estimated quantity of ERs in the respective CPA-DDs/14/ for the comparable period(i.e. 151 days).
<b>Findings</b>	CAR-06 has been raised in this context. Refer Appendix 4 of this report for detailed finding.
<b>Conclusion</b>	The actual emission reductions achieved by the three CPAs is lesser (12.08% for CPA 1, 91.24% for CPA 2 and 91.92% for CPA 3) than the estimated quantity of ERs in the respective CPA-DDs/14/. The same verified and the reason of decrease in ERs has been reported by DOE under section 3.6.6 of this report.

<b>Title and UNFCCC reference number of the CPA</b>	<b>Actual values achieved by the CPAs during this monitoring period(tCO<sub>2</sub>e)</b>	<b>Value estimated in ex ante calculation in the included CPA-DD(s)(t CO<sub>2</sub>e)</b>
<b>CPA 10443-P1-0001-CP1:</b> Madagascar Improved Cookstove Project by KCM-Wood#CPA-W- 001	13,721	15,606
<b>CPA 10443-P1-0002-CP1:</b> Madagascar Improved Cookstove Project by KCM-Wood#CPA-W-002	1,376	15,700
<b>CPA 10443-P1-0003-CP1:</b> Madagascar Improved Cookstove Project by KCM-Wood#CPA-W-003	1,268	15,700
<b>Total</b>	<b>16,365</b>	<b>47,005</b>

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

<b>Means of verification</b>	The reason for decrease in estimate ER value is mainly because the WBT test value derived from the sampling survey testing is lower than the projected value considered at the time of PoA validation or the CPA inclusion; also for the CPA 2 & 3 the total numbers of ICS distributed as on the end of monitoring period is less in numbers as compared to the projected numbers under the registered CPAs; also the inclusion date of both the CPAs (2 & 3) is much later than the start date of current monitoring period which led to a very small year fraction of CER accounting for the CPAs. CPA-DD/14/. The verification team has checked the survey report to confirm ICS usage rate including actual and ex-ante emission reductions calculation.
<b>Findings</b>	No finding has been raised.
<b>Conclusion</b>	The actual emission reductions achieved by the three CPAs is lesser (12.08% for CPA 1, 91.24% for CPA 2 and 91.92% for CPA 3) than the estimated quantity of ERs in the respective CPA-DDs/14/. The calculation is provided under the ER sheet and the reasons for decrease are described in the final MR/2/. Therefore, it is accepted by the verification team.

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

<b>Means of verification</b>	Not Applicable.
<b>Findings</b>	Not Applicable.
<b>Conclusion</b>	Not Applicable.

**E.3.8. Global stakeholder consultation**

<b>Means of verification</b>	No comments received during the global stakeholder consultation process.
<b>Findings</b>	No finding has been raised.
<b>Conclusion</b>	In accordance with §370 of CDM VVS for PoA V2/17/, verification team confirms that no comments received during the global stakeholder consultation process.

**SECTION F. Internal quality control**

&gt;&gt;

The draft verification report that is prepared by verification team is reviewed by an independent technical review team (one or more members) to confirm if the internal procedures established and implemented by Applus+ Certification were duly complied with and whether such opinion/conclusion were reached in an objective manner that complies with the applicable CDM rules/requirements. The technical review team is collectively required to possess the technical expertise of all the technical area/ sectoral scope the project activity relates to. All team members of technical review team are independent of the verification team.

During the technical review process additional findings may be identified or the closed-out findings may be opened, which needs to be satisfactorily resolved before the request for issuance is submitted to UNFCCC. The independent technical reviewer may either approve the report as such or reject/return the same in such case providing the comments/findings/issues that needs to be resolved by the verification team. The decision taken by the Technical Reviewer is final and is authorized by the Managing Director on behalf of Applus+ Certification.

**SECTION G. Verification opinion**

&gt;&gt;

Applus+ Certification, contracted by Korean Carbon Management Ltd. (the CME for the PoA), has performed the first independent verification of the emission reductions for the registered CDM PoA 10443 "Madagascar Improved Cookstove Project by KCM" in Madagascar for the monitoring period 01/01/2019 – 31/05/2019 (including both days) as reported in the Monitoring Report (public) Version 01 dated 04/06/2019/1/. The CME is responsible for the collection of data in accordance with the monitoring plan and the reporting of GHG emissions reductions from the PoA.

This verification report is for three CPAs/14/ (i.e. UN Reference: CPA 10443-P1-0001-CP1, CPA 10443-P1-0002-CP1 and CPA 10443-P1-0003-CP1) which were included at the UNFCCC webpage within the end of the current monitoring period. A single monitoring report has been prepared by the CME for the same in which implementation of the three CPAs along with monitoring results are included.

Applus+ Certification confirms that the monitoring system is in place and the emission reductions are calculated without material misstatements. This verification report has been prepared using the latest available template specified by UNFCCC and complies with the instructions to follow as per § 22 and 23 of CDM VVS for PoA, V2/17/.

The verification activities were conducted in accordance with Applus+ Certification's CDM Quality Manual System as per the steps indicated under Section A of this report. The verification process has resulted in conclusion that the included CPAs (i.e. CPA-0001, 0002 and 0003) confirm to the PoA-DD/14/ and respective CPA-DDs/14/ as well as comply with applicable CDM rules and regulations and in accordance with applied monitoring methodology AMS II.G., Version 09/18/. All Correction Requests and Clarification Requests are satisfactorily addressed by CME and accordingly the CDM documents (MR version 03,1 and ER version 04) are revised and finalized.

As a result, it is confirmed that the emission reductions as 16,365 tCO<sub>2</sub>e from the CDM PoA 10443 "Madagascar Improved Cookstove Project by KCM" are correctly reported in the Monitoring Report (final) Version 03.1, dated 14/05/2020 and corresponding ER spreadsheet (version 04, dated 14/05/2020) for the monitoring period 01/01/2019 – 31/05/2019 (including both days). Therefore, this will be submitted as part of request for issuance as per CDM PCP for PoA, V2/17/.

**SECTION H. Certification statement**

&gt;&gt;

Applus+ Certification's verification approach is based on the understanding of the risks associated with reporting of GHG emission data and the controls in place to mitigate these. Applus+ Certification planned

and performed the verification by obtaining evidence and other information and explanations that Applus+ Certification considered necessary to give reasonable assurance that reported GHG emission reductions are fairly stated.

In our opinion the GHG emissions reductions reported for the PoA for the period 01/01/2019 – 31/05/2019 (including both days) are fairly stated in the Monitoring Report (final) Version 03.1, dated 14/05/2020.

Applus+ Certification, based on outcome of verification activities, certify in writing that, during the monitoring period 01/01/2019 – 31/05/2019 (including both days), the registered CDM PoA10443“Madagascar Improved Cookstove Project by KCM” and three included CPAs (i.e. UN Ref: CPA 10443-P1-0001-CP1, CPA 10443-P1-0002-CP1 and CPA 10443-P1-0003-CP1) in the registered CDM PoA achieved the verified amount of 16,365 tCO<sub>2</sub>e reductions in anthropogenic emissions by sources of greenhouse gases that would not have occurred in the absence of the CPA.

The verified amount of emission reductions is stated below for each CPA and as per commitment period;

CPAs (included in this Issuance request)	Emission Reductions achieved in this monitoring period	
	Up to 31/12/2012 (1 <sup>st</sup> commitment period)	01/01/2013 onwards (2 <sup>nd</sup> commitment period)
CPA 10443-P1-0001-CP1	NIL	13,721
CPA 10443-P1-0002-CP1	NIL	1,376
CPA 10443-P1-0003-CP1	NIL	1,268
<b>Total</b>	<b>NIL</b>	<b>16,365</b>

## Appendix 1. Abbreviations

Abbreviations	Full texts
AQL	Acceptable Quality Level
BE	Baseline Emissions
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CDM EB	CDM Executive Board
CERs	Certified Emission Reductions
CL	Clarification Request
CME	Coordinating or Managing Entity
CMP	Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol
CO <sub>2</sub> e	Carbon dioxide equivalent
COP	Conference of Parties
CEDII	<i>Centre d'échange, de documentation et d'information inter-institutionnelle</i>
CPA	Component Project Activity
DD	Design Document
DNA	Designated National Authority
DOE	Designated Operational Entity
EF	Emission Factor
ERs	Emission Reductions
FAR	Forward Action Request
GHGs	Greenhouse Gas(es)
GPRS	General Packet Radio Service
GPS	Global Positioning System
GWh <sub>th</sub>	Giga Watt Hour (Thermal, in this document)
ICS	Improved Cook Stove(s)
ISO	International Organization of Standardization
IPCC	Intergovernmental Panel on Climate Change
KP	Kyoto Protocol
LE	Leakage Emissions
MR	Monitoring Report
MP	Monitoring Period
NA	Not Applicable
PE	Project Emissions
PoA	Programme of Activities
PRC	Post-registration change(s)
PS	Project Standard
PCP	Project Cycle Procedure
QA/QC	Quality Assurance/Quality Control
SMS	Short Message Service (Text Messages)
UNFCCC	United Nations Framework Convention on Climate Change
UQL	Unacceptable Quality Level
VVS	Validation & Verification Standard
WBT	Water Boiling Test

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

According to the sectoral scope / technical area and experience in the sectoral or national business environment, Applus+ Certification has composed a project assessment team in accordance with the appointment rules in the internal Quality Management System of Applus+ Certification. The composition of audit team shall be approved by the Applus+ Certification ensuring that the required skills are covered by the team.

The four qualification levels for team members that are assigned by formal appointment rules are as presented below:

- Lead Auditor (LA).
- Auditor (A).
- Technical Expert (TE) / Technical Expert in Training (TEiT).
- Technical Reviewer (TR).

The sectoral scope / technical area knowledge linked to the applied methodology/ies shall be covered by the assessment team.

Name	Qualification	Coverage of scope	Coverage of technical Area	Financial aspect	Attendance to the On-Site Assessment
Vivek Kumar Ahirwar	Lead Auditor (LA) / Technical Expert (TE)	Yes (3)	Yes (3.1)	N/A	Yes
Miguel A. Cortés Díaz	Technical Reviewer (TR) / Technical Expert (TE)	Yes (3)	Yes (3.1)	N/A	N/A
Simon Shen	Technical Reviewer (TR) / Technical Expert in Training (TEiT)	No	No	N/A	N/A

The curricula vitae of the DOE's team members are provided below:

Name	SHORT CV. BACKGROUND INFORMATION
Vivek Kumar Ahirwar	<p>He is a BEE-Certified Energy Auditor by Govt. of India with over seven years of relevant experience in energy efficiency, energy audit and energy conservation in energy intensive industries, designated consumers and commercial buildings, implementation of energy conservation building codes, research, process and green building projects. He is a certified lead auditor for ISO 14001 EMS and 14064. He has experience under various categories of projects stating from renewable to waste to supercritical projects and WCD. He has successfully audited more than 100 GHG (CDM/VCS/GS) projects in different states across the India.</p> <p>He has done Master in Technology (Energy Management) from a premier institute, School of Energy &amp; Environmental Studies, DAVV, Indore (M.P.), India and Bachelor of Engineering (Mechanical Engineering) from Govt. Engineering college, Rewa, RGPV, India</p>
Miguel A. Cortés Díaz	<p>Mr. Miguel Cortés holds a Bachelor's Science Degree on Civil and Environmental Engineering, being specialized on Hydric Resources.</p> <p>He has worked as CDM/VCS/GS and environmental consultant for different industries of multidisciplinary sectors world widely.</p> <p>Mr. Miguel Cortés counts with several years of GHG assessment experience, working and being qualified as Lead Auditor and Technical Reviewer for different DOEs world widely, as well as has been part of Gold Standard expert's committees.</p> <p>Furthermore, he has performed his professional GHG assessment portfolio career</p>

	worldwide and focusing in Latin America, developing assessments for projects in Argentina, Mexico, Panama, Colombia and Chile, among others.
Simon Shen	<p>Simon Shen (Master's Degree in Thermal Energy Engineering, Bachelor's Degree in Environmental Engineering) is an Auditor appointed by Applus+ LGAI for the GHG project assessment, auditing and technical review.</p> <p>He has more than 6 years of work experience in CDM/GS4GG/VCS project assessment and review with Applus+, apart from the years of experience working as GHG Auditor and ISO 9001/14001 in TUV SUD before he joined Applus+ for 3.5 years.</p> <p>Mr. Simon Shen has extensive experience also as former Applus+ Shanghai CDM Technical Manager.</p>

### Appendix 3. Documents reviewed or referenced

No.	Author	Title	References to the document	Provider
1	Korea Carbon Management Ltd.	Monitoring Report (made publicly available)	Version 1 dated 04/06/2019	CME
2	Korea Carbon Management Ltd.	<p>Monitoring Report (version 02)</p> <p>Monitoring Report (version 03, version after RFR)</p> <p>Monitoring Report (version 03.1, final version after RFR Ruling comment)</p>	<p>Version 2 dated 17/07/2019</p> <p>Version 3 dated 21/01/2020</p> <p>Version 03.1 dated 14/05/2020</p>	CME
3	Korea Carbon Management Ltd.	<ul style="list-style-type: none"> <li>ER spread sheet corresponding to MR</li> <li>ER spread sheet corresponding to MR (final version at RFR)</li> <li>ER spread sheet corresponding to the final MR version 03.1</li> </ul>	<p>Version 1.0 (dated 04/06/2019)</p> <p>Version 2.0 (dated 17/07/2019)</p> <p>Version 3.0 (dated 21/01/2020)</p> <p>Version 4.0 (dated 14/05/2020)</p>	CME
4	Korea Carbon Management Ltd.	<ul style="list-style-type: none"> <li>Sample Size Calculation Spreadsheet Madagascar, ver 01 (File Name: "Sample Size &amp; Monit Survey_May2019_PoA10443_Final")</li> <li>Sample Size Calculation Spreadsheet Madagascar, ver 02 (File Name: "Sample Size &amp; Monit Survey_May2019_PoA10443_Ver02_21Jan2020")</li> <li>Sample Size Calculation Spreadsheet Madagascar, ver 03 (File Name: "Sampling Sheet (PoA10443)_1st Ver_revised ver03(May2020)-Final")</li> </ul>	<p>Version 01, dated 04/06/2019</p> <p>Version 02, dated 21/01/2020</p> <p>Version 03, dated 12/05/2020</p>	CME
5	Korea Carbon	ICS registration database till end date of	-	CME



	Management Ltd.	1 <sup>st</sup> MP (i.e. 31/05/2019)		
6	Korea Carbon Management Ltd.	Reports of sampling survey conducted for Madagascar(Survey Data Spreadsheet)  Certificate of WBT Tests for ICS along with Data Sheet for WBT for the SR stove.	-	CME
7	Korea Carbon Management Ltd.	Technical Specification of “Soa-Rehitra” from Manufacturer / supplier (including photos of some installed ICSs)	-	CME
8	National Center Industrial and Technological Research	<ul style="list-style-type: none"> <li>• User Manual of the weighing scale used for WBT tests</li> <li>• Certificate of Calibration of Weighting Scale issued by third party (i.e. National Center Industrial and Technological Research)</li> </ul>	Dated 28/06/2019	CME
9	Korea Carbon Management Ltd.	Water boiling test Forms (13 sheets)	-	CME
10	Korea Carbon Management Ltd.	Survey SR Forms	-	CME
11	Korea Carbon Management Ltd.	Sample copies of ICS End User Agreement signed by the ICS User at the time of Distribution of ICS	-	CME
12	Korea Carbon Management Ltd.	Sample copies of filled CME monitoring survey questionnaire	-	CME
13	Applus+ Certification	DOE Field Survey of Registered ICS Users	-	Others
14	CDM EB	<ul style="list-style-type: none"> <li>• Revised approved PoA-DD for “Madagascar Improved Cookstove Project by KCM” UNFCCC PoA 10443</li> <li>• Approved CPA-DDs for the respective CPAs <ul style="list-style-type: none"> <li>– CPA10443-0001,</li> <li>– CPA 10443-0002 and</li> <li>– CPA 10443-0003.</li> </ul> </li> </ul>	Version 4.0 dated 15/10/2018  Version 02 dated 14/12/2018  Version 01 dated 04/03/2019  Version 01 dated 14/03/2019	Others
15	KBS Certification Services Pvt. Ltd.	PoA Validation report for “Madagascar Improved Cookstove Project by KCM” UNFCCC PoA 10443	<a href="#">Weblink</a>	Others
16	KBS Certification Services Pvt. Ltd.	CPA 10443-0001 Validation report for “Madagascar Improved Cookstove Project by KCM” UNFCCC PoA10443	Version 02dated 20/12/2018 <a href="#">Weblink</a>	Others
17	CDM EB	a) CDM Validation and Verification Standard for PoA	Version 02	Others

		b) CDM Project Standard for PoA c) CDM Project Cycle Procedure for PoA		
18	CDM EB	Approved CDM consolidated baseline and monitoring methodology AMS-II.G. “Energy efficiency measures in thermal applications of non-renewable biomass” (Version 09)	<a href="#">Web link</a>	Others
19	Websites	Websites referred: <a href="http://www.itouchmap.com/latlong.htm">http://www.itouchmap.com/latlong.htm</a> b. <a href="http://www.ipcc-nggip.iges.or.jp/">http://www.ipcc-nggip.iges.or.jp/</a>	-	Others
20	Korea Carbon Management Ltd.	CDM Monitoring and WBT Survey Staff training Records	-	Others
21	CDM EB	Monitoring Report Form for CDM programme of activities along with Instruction for filling out monitoring report form	Version 03 dated 31/05/2019	Others
22	Global Alliance for Clean Cookstoves	The Water Boiling Test Protocol	Version 4.2.3 Version 4.2.4 (latest)	Others
23	CDM EB	Standard: Sampling and surveys for CDM project activities and programme of activities	Version 07	Others
24	CDM EB	Guideline: Sampling and surveys for CDM project activities and programme of activities	Version 04	Others
25	Applus+ Certification	DOE WBT during site visit report	-	DOE
26	KBS Certification Services Pvt. Ltd.	CPA 10443-0002 Validation report for “Madagascar Improved Cookstove Project by KCM” UNFCCC PoA10443	Version 01 dated 28/03/2019 <a href="#">Weblink</a>	Others
27	KBS Certification Services Pvt. Ltd.	CPA 10443-0003 Validation report for “Madagascar Improved Cookstove Project by KCM” UNFCCC PoA10443	Version 01 dated 28/03/2019 <a href="#">Weblink</a>	Others
28	CDM EB	Tool 30 “Calculation of fraction of non-renewable biomass”	Version 01	Others
29	Korea Carbon Management Ltd.	f <sub>NRB</sub> value calculation sheet	-	CME
30	CEDII	f <sub>NRB</sub> survey conducted by a local Centre for Information & Research named “CEDII” validated and accepted by host country DNA in Madagascar	-	Others

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

**Table 1. Remaining FAR from validation and/or previous verification**

FAR ID	N/A	Section no.	N/A	Date:	N/A
<b>Description of FAR</b>					
N/A					
<b>Project participant response</b>					<b>Date:</b> N/A
N/A					
<b>Documentation provided by the CME</b>					
N/A					
<b>DOE assessment</b>					<b>Date:</b> N/A
N/A					

**Table 2. CLs from this verification**

CL ID	01	Section no.	MR	Date :	09/07/2019
<b>Description of CL</b>					
<ol style="list-style-type: none"> <li>1) CME is requested to submit the scanned copies of the Calibration document of the instruments used during the WBT on sampling, which was verified during site visit.</li> <li>2) CME is requested to submit the English translated versions of the lab test and calibration documents which was discussed and verified during the site visit</li> <li>3) CME is requested to submit the stove distribution database excel file with all headings and sub-headings (and other applicable texts) in English version.</li> <li>4) CME is requested to Clarify the nomenclature assigned to the stove serial numbering system and justify how it is consistent with registered PoA DD</li> </ol>					
<b>CME response</b>					<b>Date :</b> 18/07/2019
<ol style="list-style-type: none"> <li>1) CME is hereby confirming that all the documents which were produced to DOE in originals at the time of site visit, are also submitted to DOE in scanned copies along with the DVR responses.</li> <li>2) The certified copy of the English translated version of the lab test report and other calibration related documents are submitted to DOE along with this responses.</li> <li>3) The complete English version of the stove distribution database Excel sheet has been submitted to DOE.</li> <li>4) CME would like to clarify that the section A.1 of the registered PoA-DD prescribes a record keeping system; the unique identification of the project is prescribed based on a user's information collected through the Beneficiary Agreement and compiled in distribution record. As per that, the unique serial code of the project stove shall be considered as &lt;year&gt;&lt;StoveType&gt;&lt;fuel type&gt;&lt;CPA number&gt;&lt;number assigned to that particular stove&gt;. For example, let's consider the following serial number "18SRWX1-XXXX1" for a project stove.  Here, the inscription "18" stands for particular year (i.e. 2018), "SR" for stove type e.g. "Soarehitra" and "W" for fuel type, i.e. Woody biomass, Serial number X1 stands for CPA number and XXXX1 stand for serial number inscribed to the stove at the time of production.  As we can confirm from the CPA distribution database, beneficiary agreement and also from the actual stoves operational on ground, this coding/serial number methodology is consistently followed for all stoves. The coding in same prescribed format has been assigned to all project stoves uniquely and hence the coding/nomenclature of the Project stove is in line with the registered POA-DD.</li> </ol>					
<b>Documentation provided by the CME</b>					

1) Scanned copies of all the supporting documents. 2) English translated version of the lab test report certificate. 3) Distribution database Excel sheet in English version 4) Sample copies of Beneficiary Agreement and simple photos of some operational stoves with stove serial numbers.	
<b>DOE assessment</b>	<b>Date:26/07/2019</b>
1. DOE well received all documents scanned copies which were produced by CME at the time of site visit.  2. DOE well received English translated version of the lab test report and other calibration documents.  3. DOE well received English version of the stove distribution database from CME.  4. Verification team accepted CME response on nomenclature assigned to the stove serial numbering system which is consistence with registered PoA DD.	
CL# 1 closed	

Table 3. CARs from this verification

<b>CAR ID</b>	01	<b>Section no.</b>	Monitoring Report	<b>Date : 09/07/2019</b>
<b>Description of CAR</b>				
The CME should adopt the latest available "Monitoring report form for CDM programme of activities" version 3.				
<b>CME response</b>				<b>Date : 18/07/2019</b>
CME would like to clarify that at the time of initial submission for public listing, the version 02 of MR template was available, hence MR was developed in version 02. However, the MR template is now updated as per version 03. Please refer to the version 02 of the MR (dated 17 July 2019) which is the version 03 of the MR-Form prescribed by UNFCCC.				
<b>Documentation provided by the CME</b>				
Updated version of the MR (version 02, 17/07/2019) which is as per version 03 of the MR-Form.				
<b>DOE assessment</b>				<b>Date:26/07/2019</b>
Verification team accepted CME response and updated MR form version 3.				
CAR#1 Closed				

<b>CAR ID</b>	02	<b>Section no.</b>	Monitoring Report	<b>Date : 09/07/2019</b>
<b>Description of CAR</b>				
CME should correct PoA DD version and date. Registered PoA DD version is 04 dated 15/10/2018.				
<b>CME response</b>				<b>Date : 18/07/2019</b>
CME has corrected the reference to registered PoA-DD version, which is version 04, dated 15/10/2018, in the revised MR.				
<b>Documentation provided by the CME</b>				
Revised version of the MR (version 02, 17/07/2019)				
<b>DOE assessment</b>				<b>Date:26/07/2019</b>
Verification team confirms that CME has updated the PoA DD version and date in revised MR version 2 dated 17/07/2019.				
CAR#2 Closed				

<b>CAR ID</b>	03	<b>Section no.</b>	Monitoring Report	<b>Date : 09/07/2019</b>
<b>Description of CAR</b>				

1. Please justify the lifetime of the stoves reported under the section #E.1 of the MR. The value is not consistent with the ex-ante value validated in the registered CPA-DDs.
2. CME is requested to justify how the consideration of commissioning dates for stoves are in line with the registered monitoring parameter and how is it conservative to account the period of ERs for each stove?

CME response	Date : 18/07/2019
<ol style="list-style-type: none"> <li>1. CME would like to intimate that it was a typo error in the MR for the life-time of the project stove. The lifetime of the project stove is 5.5 years, which is based on the third party report from "The National Center of the Industrial and Technological Research", as registered under the CPAs (CPA1, 2 &amp; 3). The value has been corrected in the MR and is now consistent with registered ex-ante parameter.</li> <li>2. CME would like to clarify that the commissioning dates of project stoves are considered as per the registered PDD. The registered PDD prescribes that <i>"to establish the date of commissioning, the Project Participant may opt to group the devices in "batches" and the latest date of commissioning of a device within the batch shall be used as the date of commissioning for the entire batch"</i>.</li> </ol> <p>In order to be conservative in emission reduction calculation, CME has considered the last date of distribution of a particular month as the date of complete commissioning of the stove batch distributed for that particular month. Here CME would like to clarify that the production of particular type of ICS (i.e. SaoRehita) is a continuous process, there is no batch-wise production. Similarly distribution of stoves are also a continuous process however there are different numbers of stoves distributed in each month which can be counted from the distribution database (also from the user's agreement copies). Therefore, start date of accounting of emission reductions for stoves distributed in a particular month has been considered as the next day of the last date of stove distribution for that month. This is the most conservative approach.</p> <p>The details related to date of accounting of stoves are of provided in the ER calculation sheet. In the current monitoring period, the total numbers of stoves included are the stoves distributed till 15<sup>th</sup> May 2019.</p>	

Documentation provided by the CME	
Revised version of the MR (version 02, 17/07/2019)	
DOE assessment	Date:26/07/2019
<ol style="list-style-type: none"> <li>1. Verification team confirms that CME has updated the lifetime of stove in section E1 of revised MR which is consistent with the ex-ante value validated in the registered CPA-DDs.</li> <li>2. Verification team accepted CME's response that consideration of commissioning dates for stoves are in line with the registered monitoring parameter and it conservative to account the ERs for current monitoring period.</li> </ol> <p>CAR#3 Closed</p>	

CAR ID	04	Section no.	Monitoring Report	Date : 09/07/2019
Description of CAR				
<p>CME is requested to Clarify the following related to the sampling survey:</p> <ol style="list-style-type: none"> <li>a) How is the sample size calculated in order to achieve desired confidence/precision?</li> <li>b) How were the samples selected on random basis, and whether same samples were survey/tested during the monitoring survey?</li> <li>c) Please clarify if there is any non-response out of the initially selected random samples? If yes, how it has been recorded and over sampling is done?</li> <li>d) Please clarify if the result derived from WBT tests conducted on the samples is conservative?</li> <li>e) c) Please justify the credibility of the person(s) who conducted the WBT tests during the sampling?</li> </ol>				
CMEResponse				Date : 18/07/2019

- a) PP would like to confirm that the sample size for the sampling monitoring survey has been calculated in line with the registered Sampling Plan prescribed in the PoA-DD. In line with the registered sampling plan, for the estimation of the proportion or mean value of the parameters investigated, the minimum sample size for each sample frame has been calculated based on 95/10 confidence/precision which will suffice for biennial sampling. Therefore, the appropriate sample size calculation formula has been used for 95/10 confidence/precision level. Moreover, since the total population was combination of three CPAs, therefore the sample size of the respective sample frame is proportionately distributed for each CPA and rounded up values have been considered, so that selection of random samples can be proportionately taken from all the three CPAs. The use of formulae, calculation, and cross check of confidence/precision etc. are submitted in the form a separate excel sheet, which was submitted to DOE for further reference and verification.
- b) CME would like to confirm that selection of samples were based on Random selection; and for such random selections an online randomizer has been used (<https://www.randomizer.org/>). Also, in order to confirm the random selection based on this online randomizer, the screen shoots of the randomizer website at the point of random result generation were kept for references. The same samples which were generated by the randomizer were considered for monitoring survey and testing. The copies of the survey forms submitted to DOE which can be crosschecked with the "sample selection" sheet to confirm that the same samples were surveyed/tested during the monitoring survey conducted for this verification.
- c) CME would like to clarify that there was no non-response sample received/found during the monitoring survey and WBT on randomly selected samples. Therefore, there are no details available for such non-response samples. Also, w.r.t. over sampling, we would like to clarify that there was no need of any over sampling as from the calculated & identified samples and from their 100% response the desired precision/confidence was met. Moreover, the sample size calculation was done on conservative manner (by applying t-distribution and considering rounded up figures) and all selected samples were surveyed and tested for the respective monitoring parameters.
- d) CME would like to confirm that the calculated result of WBT (i.e. 31.5%) from the sample testing is found to be conservative as it's less than the ex-post value of ICS efficiency considered (i.e. based on lab test) during the validation (as already mentioned in the registered PoA-DD). Also, the resulted value is considered based on weighted average efficiency; moreover during the sample testing the precision/confidence level were cross checked from achieved results. Thus overall estimation and comparison both confirm the conservativeness of the WBT value considered for ER calculation.

CME would also like to refer to the WBT testing done on ground during the time of site visit in presence of DOE assessment team. The WBT result estimated from this testing was about 35%, which was derived based on required practices, equipment etc. in line with the WBT protocol (version 4.2.4). It also confirms that the WBT value considered for ER calculation is conservative and is within the prescribed limit.

- e) CME would like to confirm that WBT testing during the sample monitoring survey was done by Mr. Mamisoa Razafimanantsoa, from CNRIT Lab, Department of Energy, Madagascar. The tester is a Researcher at the National Centre for Industrial and Technological Research, having 30 years of work experience in the field of Thermal Energy & Industrial processes. Thus, the WBT tests were conducted by credible and experienced professional who represents the third party.

A short bio of the person and his declaration letter with the verified seal of CNRIT lab has been submitted to DOE during the audit.

Documentation provided by the CME	
a)	Monitoring Survey Sheet, version 01, dated 4th Jun 2019
b)	Screen shots of online randomizer selecting random samples for monitoring survey
c)	WBT Test sheet (as per WBT protocol)
d)	Calibration details of WBT test equipment, Certification from Lab and Biodata of the WBT tester.
DOE assessment	Date: 26/07/2019

Verification team accepted CME's responses and clarifications on sampling survey method for current monitoring period.
CAR#4 Closed

<b>CAR ID</b>	05	<b>Section no.</b>	Monitoring Report	<b>Date : 09/07/2019</b>
<b>Description of CAR</b>				
CME is requested to demonstrate the current practice of stove distribution, record keeping practice, PoA and CPA databases etc. more elaborately under the monitoring section. Also, few sample copies of distribution records (registration form) can be included to support the description.				
<b>CME response</b>				<b>Date : 18/07/2019</b>
CME has revised the monitoring section (Section D) of the MR to include more details related to stove distribution, record keeping and database management etc. for better representation of the overall monitoring system of the CPAs.				
Also, a few sample copies of distribution records (i.e. the users' agreement copy which is the registration form) are included under an Appendix (01) to the MR in order to support the description added under the section D of the MR.				
<b>Documentation provided by the CME</b>				
Revised version of the MR (version 02, 17/07/2019). Sample copies of distribution records (user registration forms).				
<b>DOE assessment</b>				<b>Date:26/07/2019</b>
Verification team accepted CME's response and closed the finding successfully.				
CAR#5 Closed				

<b>CAR ID</b>	06	<b>Section no.</b>	Monitoring Report	<b>Date : 09/07/2019</b>
<b>Description of CAR</b>				
CME should include CPA wise breakup of achieved emission reduction during monitoring period 01/01/2019 to 31/05/2019 in section C.1.				
<b>CME response</b>				<b>Date : 18/07/2019</b>
CME would like to update the CPA wise calculated emission reductions are already included under the section F.5 of the MR. Therefore, a footnote reference has been included under the section C.1 of the revised MR to refer the CPA wise breakup of ERs. Also, the calculation reference can be verified from the ER sheet, version 02 which provides CPA wise ERs.				
<b>Documentation provided by the CME</b>				
Revised version of the MR (version 02, 17/07/2019) Revised version of the ER sheet (version 02, 17/07/2019)				
<b>DOE assessment</b>				<b>Date:26/07/2019</b>
Verification team clarify CME has included CPA wise breakup of achieved emission reduction in section C.1 of revised MR.				
CAR#6 Closed				

Table 4. FAR from this verification

<b>FAR ID</b>	N/A	<b>Section No.</b>	N/A	<b>Date:</b> N/A
<b>Description of FAR</b>				
N/A				
<b>CME response</b>				<b>Date:</b> N/A
N/A				
<b>Documentation provided by the CME</b>				
N/A				
<b>DOE assessment</b>				<b>Date:</b> N/A
N/A				

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**Document information**

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