




**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 Number: 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>	01	
<b>Completion date of the verification and certification report</b>	25/08/2020	
<b>Monitoring period number and duration of this monitoring period</b>	Monitoring Period Number 03 01/11/2019 to 31/05/2020(inclusive of both dates)	
<b>Number and version number of the monitoring report to which this report applies</b>	Monitoring Report number 03 Monitoring Report Version 02	
<b>Coordinating/managing entity (CME)</b>	Korea Carbon Management Ltd.	
<b>Host Parties</b>	Host Parties of the PoA	Is this a host Party to a CPA covered in this report?(yes/no)
	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>	167,575 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>	143,301 tCO <sub>2</sub> e	
<b>Name and UNFCCC reference number of the DOE</b>	LGA 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. There are currently two types of ICS ("SoaRehitra" wood stove which is a portable model and "Lamasinina" wood stove which is a fixed stove model) that are disseminated through this programme. The project activity has replaced the prevailing inefficient three-stone open fires or equivalent with stoves at baseline with ICS, which combusts wood more efficiently and improves thermal transfer to pots, hence leads to saving fuel and lowering greenhouse gas emissions. This monitoring period includes the implementation and monitoring of nine CPAs (i.e. UN Ref. CPA 10443-P1-0001-CP1, CPA 10443-P1-0002-CP1, CPA 10443-P1-0003-CP1, CPA 10443-P1-0004-CP1, CPA 10443-P1-0005-CP1, CPA 10443-P1-0006-CP1 and CPA 10443-P1-0007-CP1 CPA 10443-P1-0008-CP1 CPA 10443-P1-0009-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 the monitoring report, thus complying with §259 of CDM PS for PoA, V2/17/ and §340 of CDM VVS for PoA, V2/17/.

LGAI Technological Center, S.A.(hereafter referred to as Applus+ Certification) has performed the first and second verification of the CDM PoA "Madagascar Improved Cook-stove Project by KCM" having its UNFCCC PoA Reference Number 10443. This is the third verification of the PoA, 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 remote audit 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, 10443-0003, 10443-0004, 10443-0005, 10443-0006, 10443-0007, 10443-0008 and 10443-0009) and the monitoring plan, and the corresponding validation opinion;
- (b) The PoA validation report and respective CPA validation reports;
- (c) The applied monitoring methodology;
- (d) The monitoring report to verify that it is as per the standardized format;
- (e) CER calculations sheet, Sampling Survey Sheets and all other 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 (Outsourced entity)	Y	N	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.	Approver	IR	Sendin	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 & second 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 02)
Emission reductions	144,010 tCO <sub>2</sub> e	143,301
Identified Threshold	5.0%	5.0%

In accordance to the §36 of the applied methodology/18/, the sample size can be 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 biennial sampling in the 2<sup>nd</sup> ex-post monitoring survey/4/. This sampling surveys & testings were conducted in the month of November 2019 (4<sup>th</sup> to 15<sup>th</sup> November 2019), which covered total 6 CPAs under two different sampling frames (frame 1 for SaoRehitra Portable ICS and frame 2 for Lamasinina fixed ICS). The ICS distribution under CPA 7<sup>th</sup>, 8<sup>th</sup> & 9<sup>th</sup> were conducted after this survey dates and are currently part of the 3<sup>rd</sup> monitoring report. The verification team has reviewed the CPAs and also evaluated the activities during the remote audit and found that the CPA 7<sup>th</sup> & 9<sup>th</sup> include the same portable ICS type – SaoRehitra and CPA 8<sup>th</sup> also includes the same fixed ICS type – Lamasinina. All these CPAs are implemented in different villages and districts but within the same region “Haute Matsiatra”. Therefore technology and beneficiary both are homogenous and representative of the sampling surveys conducted during Nov 2019. Additionally, CME has described and justified in the MR about the applicability of sampling survey results as per “General Guidelines for SSC CDM Methodologies”, version 23.0, para 27. The verification team has reviewed the same and found acceptable, same is discussed in later section of the report. Therefore, VVB concludes that the results of the previous sampling surveys and WBT testings are applicable for the current monitoring period, approach is appropriate and reliable.

Parameter	Reporting Frequency	No. of Discreet Data (100%)	Sample size selected for verification	Type of error identified (Isolated/ Systematic)	Impact on ERs	
					Extrapolated for population size (Qty and %)	Within Threshold (Yes/No)
<b>N<sub>y,i,j</sub></b>	At least once every two years through Sampling Monitoring Survey	43 samples from CME's monitoring survey for sampling frame 1 (SR portable ICS); and 43 samples from CME's monitoring survey for sampling frame 2 (Fixed ICS)	18 samples from each sampling frame from CME's monitoring survey records (Acceptance sampling)	No error found.	No Impact	Yes
<b>Date of commissioning of project device i</b>	Continuous recording at the time of distribution of project devices	Total 122,033 ICS are included during the Monitoring period across the nine CPAs.	Random cross check of ICS records from ICS registration database/5/ and copies of the End Users Agreement/11/	No error found.	No Impact	Yes

$\mu_{y,i,j}$	At least once every two years through Sampling Monitoring Survey	13 samples from Sample Frame 1 of CME's monitoring survey  11 Samples from Sampling Frame 2 of CME's monitoring survey	18 samples from each of the sampling frame CME's monitoring survey records (Acceptance sampling)	No error found.	No Impact	Yes
$\eta_{new,i,j}$	At the time of commissioning or distribution, followed by annual loss of efficiency as per para 27(a) of the applied methodology	Not applicable for Sample Frame 1 of CME's monitoring survey. The same has been referred from the WBT results of the first monitoring and verification.  11 Samples from Sampling Frame 2 of CME's monitoring survey.	Value of the parameter for SaoRehita ICS has been referred from previous monitoring period, verified from the third party certified WBT sampling report.  All WBT results under sampling frame 2 have been verified through WBT Survey reports certified by third party agency/6/	No error found.	No Impact	Yes
$N_{d,HH}$	Continuous recording at the time of distribution of project devices	Total 122,033 ICS are included during the Monitoring period across the CPAs. Each household received only one ICS	Thorough crosscheck of ICS records from ICS registration database/5/ and copies of End Users Agreements/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 all the data related to ex-post parameters are confirmed through ex-post monitoring survey conducted by CME and verified from the third party reports, the verification team has cross verified the ex-post survey data by applying acceptance sampling approach (from the sampling size of the two sampling frames surveyed by CME, as stated above in the table). 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-CP1/25/, CPA 10443-P1-0003-CP1/26/, CPA 10443-P1-0004-CP1/27/, CPA 10443-P1-0005-CP1/27/, CPA 10443-P1-0006-CP1/28/, CPA 10443-P1-0007-CP1/28/ CPA 10443-P1-0008-CP1/34/ and CPA 10443-P1-0009-CP1/34/

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**

During the Remote Audit on 08/08/2020				
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	08/08/2020	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.	Remote Verification : Total of 36 Households verified (Implementation of PoA and CPAs) listed as below section D.3			

**D.3. Interviews**

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1.	TIANA	MANANTSOA	NGO Tandavanala, Director	08/08/2020	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.	MIORA	RIVOALIMANI TRA	Chief of Zone (Lamasinina)  (ONG TANDAVANALA, Fianarantsoa)			
5.	ROGER	RAMAROMAN DIMBY	Chief Of Zone (SR) (ONG			



			TANDAVANA LA, Fianarantsoa			
6.	ZAFIMAHERY	RABARIMANAN A	Technician of production  (ONG TANDAVANA LA, Fianarantsoa)			

Remote DOE samples Verification: Total of 36 Households verified through videos and photographs, as listed below:

Sr · N o.	CPAs	Unique Id	Household Representative	Male (M)/Female (F)	Village	Date of verification	Team Member
1.	CPA 1	18SRW0 12686	RASOARIMALALA N. ANTOINETTE	F	AMPALY	08/08/2020 to 12/08/2020	Vivek Kumar Ahirwar
2.	CPA 1	18SRW0 14847	RAZANANORO BERTHINE	F	SOAZANGA		
3.	CPA 1	18SRW0 104954	RAZAFINDRAVAO HARIMALALA FRANCOISE	F	SOAZANGA		
4.	CPA 2	19SRW0 22446	RAZAFINDRATSARA ALPHONSINE	F	ANTADY		
5.	CPA 2	19SRW0 201191	RAZAFINDRAVAO ANGELINE	F	SEVAINA		
6.	CPA 2	19SRW0 202542	RAVAOSOLO MARIE ERNESTINE	F	SEVAINA		
7.	CPA 3	19SRW0 301856	RAMANANDRAIBE Haja Tokiniaina Soavolatsinana	F	AMBONARONA		
8.	CPA 3	19SRW0 302730	VOAHIRANA Aline	F	ANJAMANA		
9.	CPA 3	19SRW0 302015	RAZAFINDRASOA Fanomezana Florine	F	ANJAMANA		
10.	CPA 4	19SRW0 400669	RAZAFINDRASOA MARTINE	F	AMBALAVAKELY		
11.	CPA 4	19SRW0 400539	RAZANARISOA IRENE VIVIANE	F	AMBALAVAKELYB		
12.	CPA 4	19SRW0 400729	RATAHINJANAHARY VICTORINE	F	AMBALAVAKELYB		
13.	CPA 5	19LW050 4698	RABAO CLARINE	F	ALATSINAINY		
14.	CPA 5	19LW050 4696	RAMAMPIANDRA ARIMANANA DIEU DONNE	M	ALATSINAINY		
15.	CPA 5	19LW050 4553	RAVOAHIRANA HANTARIVONY JUSTINE	F	SOANIERANA		
16.	CPA 5	19LW050 4756	RANDRIANARIVONY JEAN NOELSON	M	ANDOVOKA		
17.	CPA 5	19LW050 4538	RASOARIMANDIMBY MARIE LOUISETTE ANASTASIE	F	ANDOVOKA		
18.	CPA 5	19LW050 2616	RAZAFINDRAVAO	F	AMBALAMIRARY		
19.	CPA 5	19LW050 2650	RANDRIANANDRASANA JEAN FRANCOIS AUGUSTIN	M	MANDREMB		
	CPA 5	19LW050 2638	RANDRIANASOLONDRABE JOSEPH	M	AMBALAMIRARY		
21.	CPA 5	19LW050 9573	RAVAOSOLO MARIE CLARISSE	F	LOVIATOKANA		
22.	CPA 6	19SRW0 609148	RAZAFIMANDIMBY PAUL JOSEPH	M	AMBOASARY		
23.	CPA 6	19SRW0 605202	RAZAINAJFY SOLO MARIE JEANNE	F	AMBONIRENA		
24.	CPA 7	19SRW0 700485	RAZANAJATOVO ELYSE	M	TAMBOHOBE VOHITSIKY		
25.	CPA 7	19SRW0 704925	RAZAFINDRATSARA MARIE JULIENNE	F	AMBALANDAPA		
26.	CPA 8	20LW080	HANTA MARIE PERLINE	F	ANALAMAY		

Sr No.	CPAs	Unique Id	Household Representative	Male (M)/Female (F)	Village	Date of verification	Team Member
.		0857					
27	CPA 8	20LW080 1946	RAMPIZAFY SÉRAPHINE	F	ANALAMAY		
28	CPA 8	20LW080 0428	RASOAMIARINARIVO MARIE EDWIGE	F	MAHAROVITRA ATSINANANA		
29	CPA 8	20LW080 0411	RALAIVAO	M	MAHAROVITRA ATSINANANA		
30	CPA 8	20LW080 0429	RAVAO CECILE	F	MAHAROVITRA ATSINANANA		
31	CPA 8	20LW080 1657	RAJAONARIVELO CELESTIN	M	TSIENGA		
32	CPA 8	20LW080 1179	RAVELOTSALAMA NANDIMBISOA	M	AMPARIHIBE		
33	CPA 8	20LW080 1234	TSILAVIRINA	M	AMPARIHIBE		
34	CPA 8	20LW080 0404	RADALO FRANÇOIS	M	MAHAROVITRA ATSINANANA		
35	CPA9	20SRW0 903360	RAHERINIAINA NOMENJANAHARY JEAN CLAUDE	M	ASABOTSY		Vivek Kumar Ahirwar
36	CPA 9	20SRW0 902227	RAZAIARISOA BODONIRINA MICHELINE HORTENSIA	F	ASABOTSY		

#### 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/. There are two types of stove type/models included – SaoRehitra Portable Stove and Lamasinina Fixed stove; both are wood based stove locally manufactured. The SaoRehitra is distributed under the CPA #1, 2, 3, 4, 6, 7 and 9; whereas Lamasinina is distributed under the CPA#5 and 8. In line with the registered sampling plan, representative sampling had been undertaken by CME as part of a PoA-wide Sampling Plan during November 2019. There were two different sampling frames designed (i.e. by grouping and sampling across the CPAs for SaoRehitra and Lamasinina stove separately) which is in line with the requirements of the “Guideline for Sampling and surveys for CDM project activities and programme of activities”, version 04/24/. The CME had considered 95/10 confidence/precision sampling to consider sampling size for both the sampling frames. The results of this sampling surveys were used during the previous monitoring period “01/06/2019 to 31/10/2019” and also being applied to the current monitoring period “01/11/2019 to 31/05/2020”; the applicability of biennial sampling was reported and justified in line with the “General Guidelines for SSC CDM Methodologies”, version 23.0, para 27 & 28. The sampling approach undertaken by CME is duly explained under Section E.3 of the Monitoring Report/2/, followed by results of the sampling both under the section and under Appendix 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 (as version 07 is applicable as per the registered sampling plan)/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/.

Producer risk		10%		10%		10%		10%	
Consumer risk		5%		10%		15%		20%	
AQL	UQL	Sample size (n)	Acceptance number (c)	Sample size (n)	Acceptance number (c)	Sample size (n)	Acceptance number (c)	Sample size (n)	Acceptance number (c)
0.5%	10%	46	1	38	1	19	0	16	0
0.5%	15%	19	0	15	0	12	0	10	0
0.5%	20%	14	0	11	0	9	0	8	0
1.0%	10%	46	1	38	1	33	1	29	1
1.0%	15%	30	1	25	1	22	1	10	0
1.0%	20%	22	1	18	1	9	0	8	0

Accordingly, acceptance number (c) thus determined for the sample size is 1. A sample sizes of 18 meets the criteria. Therefore, the verification team together verified the 18 samples from sampling frame 1 (Frame-1 represents samples with SaoRehitra ICS models) and 18 samples from sampling frame 2 (Frame-2 represents samples with Lamasinina ICS models) and these are randomly<sup>1</sup> selected samples from each of the sampling frames (i.e. **for sampling frame 1**, three samples from CPA 1, three samples from CPA 2, three samples from CPA 3, three samples from CPA 4, two samples from CPA 6, two samples from CPA 7 and two from CPA 9. And **for sampling frame 2**, total 9 samples from CPA 5 and 9 samples from CPA 8 were taken during the remote audit and observed that all the stoves checked remotely were in operation (100%) as against the CME's surveyed results, which also indicates 100%/4/, across all the 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 CMEs sampling records for both the frames 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 (which is the registered applicable version for the PoA)/23/.

During Remote audit the verification team together verified the 36 randomly selected samples out of the total CME samples across both the sampling frames that cover all the CPAs and observed that all the results reported by CME for use of baseline stove were consistent with the survey results. None of the 36 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.

The CME has considered value of ICS Usage rate (100%) as derived from the survey and corresponds to a calculated adjustment factor for consumption value for baseline stove use in relative term, which is also 100% applied in the ER calculation; these applied values are consistent with the DOE Remote Verification 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/.

For the parameter efficiency, CME has adopted para 27(a) of the applied methodology in the registered PoA-PDD. Therefore, CME conducted WBT sampling only for the ICS batch of vintage 1, for each ICS type, to estimate the applicable conservative value of efficiency for the vintage 1. And for subsequent vintages, efficiency has been adjusted for annual loss of efficiency as per para 27(a) of the methodology. The WBT tests were conducted on the selected samples from vintage year 1 (for both the stove types) by an experienced professional under "The National Centre of Industrial And Technological Research" of Madagascar, where WBT test for SaoRehitra ICS was conducted during the first monitoring period and the

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

same for Lamasinina ICS has been conducted during the second monitoring period. The certified WBT reports were checked and the records were found to be consistent with the reported results. The verification team checked 100% of CME's WBT results and found them in order, based on correct practice, procedure and reliable. Also the approach considered by CME is conservative as the averaged out WBT values of the samples have been found to be conservative as compared to the values available at the time of CPA inclusion for ex-ante estimation of ERs. Hence, DOE would like to further opine that the value of efficiency of both the ICS considered for ER calculation is conservative, relevant and in line with the applicable provision of para 27(a) of the methodology; 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	CAR#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	CL#1	0	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	CAR#2	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
• 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	CAR#3	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).

Compliance of monitoring activities with the registered monitoring plan			
• Data and parameters fixed ex ante or at renewal of crediting period	0	CAR#5	0
• Data and parameters monitored	0	CAR#4	0
• Implementation of sampling plan	0	0	0
Compliance with the calibration frequency requirements for measuring instruments	0	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	CAR#6	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	0	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>	1	6	0

**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#1 has been raised in this context. Refer Appendix 4 of this report for detailed finding.
<b>Conclusion</b>	The verification team confirms that the updated 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**

&gt;&gt;

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	Yes.
Madagascar Improved Cookstove Project by KCM-Wood#CPA-W-002  <b>(Ref. CPA 10443-P1-0002-CP1) /25/</b>	Yes	02/04/2019	4.0	Yes.
Madagascar Improved Cookstove Project by KCM-Wood#CPA-W-003  <b>(Ref. CPA 10443-P1-0003-CP1) /26/</b>	Yes	02/04/2019	4.0	Yes.

Madagascar Improved Cookstove Project by KCM-Wood#CPA-W-004  <b>(Ref. CPA 10443-P1-0004-CP1) /27/</b>	Yes	31/08/2019	4.0	Yes
Madagascar Improved Cookstove Project by KCM-Wood#CPA-W-005  <b>(Ref. CPA 10443-P1-0005-CP1) /27/</b>	Yes	31/08/2019	4.0	Yes
Madagascar Improved Cookstove Project by KCM-Wood#CPA-W-006  <b>(Ref. CPA 10443-P1-0006-CP1) 28/</b>	Yes	15/10/2019	4.0	Yes
Madagascar Improved Cookstove Project by KCM-Wood#CPA-W-007  <b>(Ref. CPA 10443-P1-0007-CP1) /28/</b>	Yes	15/10/2019	4.0	Yes
Madagascar Improved Cookstove Project by KCM-Wood#CPA-W-008/34/  <b>(10443-P1-0008-CP1)/34/</b>	Yes	26/03/2020	4.0	No, this is the first verification for the CPA.
Madagascar Improved Cookstove Project by KCM-Wood#CPA-W-009/35/  <b>(10443-P1-0009-CP1)/35/</b>	Yes	26/03/2020	4.0	No, this is the first verification for the CPA.

## E.2. Programme of activities

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

<b>Means of verification</b>	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
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stove. KCM also provided operation & 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/.

This monitoring period includes the implementation and monitoring of total nine CPAs(i.e. also referred hereinafter as CPA-0001, CPA-0002, CPA-0003, CPA-0004, CPA-0005, CPA-0006, CPA-0007, CPA-0008 & CPA-0009) as part of PoA/14/ wherein 1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup>, 4<sup>th</sup>, 5<sup>th</sup>, 6<sup>th</sup>, 7<sup>th</sup>, and 9<sup>th</sup> CPAs have 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 8<sup>th</sup> CPA is partially distributed during the current monitoring period. The details of distribution are submitted by CME in the form of excel sheet and also included under the Appendix 1 of the MR, which were verified by DOE during the desk review and remote audit; and found consistent. All the CPAs are within the geographical boundary of Madagascar confirmed through iTouchMap website, which constitutes the physical boundary of PoA as well.

There are two models/types of the improved cookstove (ICS) disseminated i.e., "SaoRehitra" portable ICS and "Lamasinina" Fixed ICS. The CPA-0005 and CPA-0008 includes the fixed ICS "Lamasinina" whereas other CPAs include SaoRehitra ICS. Every CPA, thus promotes only one type of ICS model which makes each CPA homogenous in terms of the technology. During last two verifications; the assessment team had visited the manufacturing unit of the ICS (i.e. SaoRehitra) to understand the ICS type and technology in detail manner, also visited households to verify the physical presence, beneficiary details, operational conditions, to ensure the status of de commissioning of the baseline cooking practice, etc. Similarly, the "Lamasinina" fixed stoves are being manufactured by trained artisans in-situ and the processes is managed by representatives who have experience in working with clay and bricks or in manufacturing different types of cook stoves. Both the ICS types and details are found to be consistent with the distribution receipts that are provided under the CPA-DDs. DOE has verified both the ICS types during previous verifications and current remote audit inspection and found to be consistent distribution receipts and details provided in the CPA-DDs.



Stove Model "SaoRehitra" (or called as SR wood stove)



Stove Model Lamasinina Fixed Stove



The locations of the CPAs are reported and verified as follows:

CPA 1:

**Madagascar Improved Cookstove Project by KCM-Wood#CPA-W- 001  
(Ref. CPA 10443-P1-0001-CP1)**

The ICS (*SoaRehitra* stoves) under this CPA have been implemented across households in several villages, in different districts in the region of Haute Matsiatra, Madagascar.

State	Region	Districts
Malagasy	Haute Matsiatra	Ambalavao, Ambohimahasoa, Isandra, Lalangina and Vohibato.

CPA 2:

**Madagascar Improved Cookstove Project by KCM-Wood#CPA-W-002  
(Ref. CPA 10443-P1-0002-CP1)**

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

State	Region	Districts
Malagasy	Haute Matsiatra	Ambalavao, Fianarantsoa-I, Iakora, Ihosy, Lalangina & Vohibato

CPA 3:

**Madagascar Improved Cookstove Project by KCM-Wood#CPA-W-003  
(Ref. CPA 10443-P1-0003-CP1)**

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

State	Region	District
Malagasy	Haute Matsiatra	Vohibato

CPA 4:

**Madagascar Improved Cookstove Project by KCM-Wood#CPA-W-004  
(Ref. CPA 10443-P1-0004-CP1)**

The ICS (*SoaRehitra* stoves) under this CPA have been implemented in several villages and commune across different districts, in the region of Haute Matsiatra, Madagascar, where there is no ICS distribution so far under the other CPAs of this PoA.

State	Region	Districts
Malagasy	Haute Matsiatra	Ambalavao, Lalangina, Fianarantsoa, Isandra, Mahasoabe & Vohibato

CPA 5:

**Madagascar Improved Cookstove Project by KCM-Wood#CPA-W-005  
(Ref. CPA 10443-P1-0005-CP1)**

The ICS (Lamasinina) under this CPA have been implemented in several villages and commune of in the region of Haute Matsiatra, Madagascar, where there is no ICS distribution included under the other CPAs of this PoA.

State	Region	Districts
Malagasy	Haute Matsiatra	Ambohimahasoa, Isandra & Lalangina

CPA 6:

**Madagascar Improved Cookstove Project by KCM-Wood#CPA-W-006  
(Ref. CPA 10443-P1-0006-CP1)**

The ICS (*SoaRehitra* stoves) under this CPA have been implemented in several villages and communes across different districts in the region of Haute Matsiatra, Madagascar, where there is no ICS distribution occurred so far under the other CPAs of this PoA.

State	Region	Districts
Malagasy	Haute Matsiatra	Ambalavao, Lalangina & Vohibato

CPA 7:

**Madagascar Improved Cookstove Project by KCM-Wood#CPA-W-007  
(Ref. CPA 10443-P1-0007-CP1)**

The ICS (*SoaRehitra* stoves) under this CPA has been implemented in several villages and communes across two different districts in the region of Haute Matsiatra, Madagascar, where there is no ICS distribution occurred so far under the other CPAs of this PoA.

State	Region	Districts
Malagasy	Haute Matsiatra	Isandra & Vohibato

CPA 8:

**Madagascar Improved Cookstove Project by KCM-Wood#CPA-W-008  
(Ref. CPA 10443-P1-0008-CP1)**

The ICS (*Soarehitra* stoves) distribution under this CPA is currently under progress, a partial distribution has been achieved during the current monitoring period. However, the implemented locations and ongoing distributions include several villages and commune of in the region of Haute Matsiatra, Madagascar, where there is no ICS distribution occurred so far under the other CPAs of this PoA.

State	Region	District
Malagasy	Haute Matsiatra	Ambohimahasoa

CPA 9:

**Madagascar Improved Cookstove Project by KCM-Wood#CPA-W-009  
(Ref. CPA 10443-P1-0009-CP1)**

The ICS (*Soarehitra* stoves) under this is yet to be implemented; however proposed to be implemented in several villages and commune across different districts in the region of Haute Matsiatra, Madagascar, where there is no ICS distribution occurred so far under the other CPAs of this PoA.

State	Region	District
Malagasy	Haute Matsiatra	Ikalamavony, Isandra & Vohibato

The exact locations of the ICS are submitted under the distribution database where household reference, villages, communes, fokontany, district etc. are available. From the distribution database, every household and each ICS can be uniquely identified.

All the CPAs are, therefore implemented in different villages and districts under the region Haute Matsiatra, under the province Fianarantsoa. 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 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 the first CPA (i.e. CPA 10443-P1-0001-CP1) was

included on 24/12/2018. The monitoring period considered under this verification is "01/11/2019 to 31/05/2020" which is the 3<sup>rd</sup> monitoring period. The first stove included under the first CPA was distributed on 09/10/2018/5/ and has been verified from the distribution database and the End user Agreement signed by the ICS User/11/. However, during the current monitoring period total number of ICS distributed for the first Seven CPAs and the last CPA were complete (i.e. fully distributed as per CPA threshold numbers), for CPA 8<sup>th</sup> there was partial distribution completed. Thus, stove numbers and respective start date of crediting period for each CPA is different, hence the emission reduction accounting for respective CPAs are considered based on their respective year fractions. The detail assessment of the CPA wise ICS numbers, their age, year fraction accountable for the ER calculation are submitted by CME under the ER sheet. Information has also been reported under the appendix 1 of the MR.

The total number of stoves that were distributed under the current monitoring period is 122,033. The CPA wise monthly distribution verified from the distribution database is as follows:

CPA Reference	Months	Nos. of ICS Distributed	Reference
CPA 10443-P1-0001-CP1	Oct-18	4,592	CPA-1 Database
	Nov-18	2,045	
	Dec-18	3,363	
	Jan-19	1,503	
	Feb-19	2,177	
Total =		13,680	
CPA 10443-P1-0002-CP1	Mar-19	2,240	CPA-2 Database
	Apr-19	966	
	May-19	1,866	
	Jun-19	2,926	
	Jul-19	3,403	
	Aug-19	2,351	
Total =		13,752	
CPA 10443-P1-0003-CP1	Feb-19	1	CPA-3 Database
	Mar-19	2,366	
	Apr-19	488	
	May-19	1,142	
	Jun-19	2,142	
	Jul-19	2,323	
	Aug-19	5,290	
Total =		13,752	
CPA 10443-P1-0004-CP1	Sep-19	7,000	CPA-4 Database
	Oct-19	6,752	
Total =		13,752	
CPA 10443-P1-0005-CP1	Jul-19	24	CPA-5 Database
	Aug-19	775	
	Sep-19	3,194	
	Oct-19	1,007	
	Nov-19	5,000	
	Dec-19	3,604	
Total =		13,604	
CPA 10443-P1-0006-CP1	Sep-19	1,000	CPA-6 Database
	Oct-19	4,000	
	Nov-19	8,752	
Total =		13,752	
CPA 10443-P1-0007-CP1	Jan20	13,7520	NA
Total =		13,752	
CPA 10443-P1-0008-CP1	Mar-20	2,157	

		Apr-20	1,442	
		May-20	8,638	
	Total =		12,237	
	CPA 10443-P1-0009-CP1	Apr-20	10,213	
		May-20	3,539	
	Total =		13,752	
	<b>Total ICS distributed =</b>		<b>122,033</b>	
	<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. DOE has verified that fact that ICS are being continuously manufactured, developed and implemented at households, there is no batch wise nomination assigned separately. The 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), hence this approach is found to be conservative. 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 a conservative approach. This practice has been properly demonstrated in the ER sheet which has been further verified from the distribution databases.</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/, online observations and interview conducted during the remote audit the verification team found that the actual implementation on ground of the PoA is consistent with PoA-DD and respective CPA-DDs/14/. Also, the distribution details and each ICS are reproducible from the distribution database backed up by the beneficiary agreements. The verification team therefore confirms the authenticity of the numbers and also accepts the application of ICS numbers, year fractions etc. into the ER calculation which is accurate, conservative and acceptable.</p>			
<b>Findings</b>	CL#01 has been raised. 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 seven and last CPAs included ICSs up-to its full capacity (i.e. up-to the small scale threshold of the respective CPAs). However, the distribution of ICS is still ongoing under the 8<sup>th</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 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>	<p>Based on the interview of CME representative (CME) and monitoring team during the remote audit it was confirmed that the CME has organized an appropriate management and operational system for implementation, monitoring and reporting 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</p>
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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.

Also, it was learnt that CME field staff conducts spot-checks at household by randomly selecting 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, if any inconsistencies found (e.g., change in the address of a user) or any other type of ICS is found to exist in the household or there is any wear & tear in the project ICS, the same are to be recorded in a monitoring form and thereafter will be updated on the ICS registration database. 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/. The assessment team has cross checked this practice of spot-check during the on-site audit as a part of the 2<sup>nd</sup> monitoring & verification. There are primary records in the form of "monitoring forms"/33/ recorded as a part of the spot-check mechanism, which were verified by DOE during remote-audit. Such monitoring forms contain stamp of the local authority and information of chief of household, unique no. of ICS, date of visit, date of ICS distribution, view point/analysis about ICS and confirmation/remark on presence of other devices, etc. From the existing records/33/, the assessment team has further verified that the local monitoring agents visit households to check existence of project ICS and its operational conditions etc.; and also to ensure that there is no existence of the baseline device or any other device except the project ICS. During the spot-checks the agents fill out the monitoring form containing serial numbers of ICS after confirming/verifying its existence and then also take signature of the head of household. There is no case of any inconsistency or deviation of ICS operation in the households observed during the current monitoring period. Also, the assessment team remotely verified around 36 randomly selected households as a part of the sampling audit and no any inconsistency or deviation was observed. Hence, the assessment team of DOE confirms that ICS are operational without any inconsistency and ICS users do not have other similar device.

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 desk review of documents and a detailed discussion was held with the project team during remote audit. 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/ are 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.

The organizational structure and roles and responsibilities for monitoring are in line with the situation on the ground as observed during the remote audit and interview with monitoring staff, and the structure is considered appropriate. Moreover, CME has conducted sessions on capacity building, team training etc. on regular intervals. The records of such sessions have been checked by validation team during the remote audit and CME has also submitted the copies of such records for reference purpose as prescribed under the MR.

<b>Findings</b>	No finding has been raised.
<b>Conclusion</b>	The verification team assessed the management systems in place to verify the implementation status of 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 version 02 dated 12/08/2020/2/. 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**

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

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

&gt;&gt;

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

<p><b>Means of verification</b></p>	<p>There are 09 specific CPAs (Ref. nos. 10443-P1-0001-CP1, 10443-P1-0002-CP1, 10443-P1-0003-CP1, 10443-P1-0004-CP1, 10443-P1-0005-CP1, 10443-P1-0006-CP1, 10443-P1-0007-CP1, 10443-P1-0008-CP1 and 10443-P1-0009-CP1) included in the PoA/14/till the end of the current monitoring period and all the CPAs were covered in the current monitoring period.</p> <p>CPA target the promotion and distribution of portable ICS models “SaoRehitra” and a fixed ICS model “Lamasinina”. The Verification Team has carried out remote audit and online fields verification and conducted interviews to reach up-to a level of satisfaction and professional judgement. During the remote assessment ICS models were checked and compared to that described in the respective CPA-DDs/14/. Korea Carbon Management Ltd.(also referred as KCM) is the Coordinating and Managing Entity (CME) for the implementation of the CPAs. The CME 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>All the nine CPAs have been implemented in different villages, across different communes, districts, however all districts are within the region of “Haute Matsiatra”, under the province of Fianarantsoa, Madagascar. The distribution under the CPA-0008 has been partially completed during the current monitoring period, whereas ICS distribution under the other 8 CPAs are completed upto their full capacities.</p> <p>These information have been confirmed from ICS registration records and distribution database/5/ and also verified randomly from beneficiary agreements and spot check forms during the Remote audit; which is found to be consistent with the description given in the included the CPA-DDs (Section A.2)/14/. By the end of current monitoring period a total of 122,033 improved cook stoves (the breakup of ICS numbers across the 9CPAs are provided under the section E.2.1 above) were disseminated under the CPAs, which is within estimated quantity of the small scale threshold as per respective CPA-DDs/14/.</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> <p>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 (both in case of SaoRehitra&amp;Lamasinina). Pictures of the stove unique ID are presented below as example.</p> <div style="display: flex; justify-content: space-around; align-items: flex-end;"> <div style="text-align: center;">  <p>ICS “SR Stove”: Unique Serial Number</p> </div> <div style="text-align: center;">  <p>CME Logo</p> </div> </div>
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ICS "Lamasinina": Unique Serial Number

As shown in the images above, the unique serial codes 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 remote audit/13/ of randomly selected households. Once the ICS is installed it is revisited by CMEs field staff after few days/weeks (in general) to do regular-check whether the ICS functioning correctly. Additionally, as a part of the management plan and monitoring practice, different random spot-checks are performed by the trained ground team to ensure continued operation of the project ICS. From the remote audit 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 SaoRehitra wood stove which is a portable stove included under the CPA-0001, 0002, 0003, 0004, 0006, 0007 & 0009; whereas CPA-0005 and 0008 includes fixed ICS "Lamasinina", this has been confirmed and verified based remote audit 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 ICStype "SaoRehitra" is only 13.010MWh<sub>th</sub>/3/ and that of for ICS type "Lamasinina" is 12.991

	<p>MWh<sub>th</sub> which is very much less than 1% of the small-scale CDM thresholds i.e. 180,000 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 version-2 and explanation is provided under the MR section F.7 of the</p> <p>MR version 02 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>	CAR#02 has been raised. Refer Appendix 4 of this report for detailed finding.
<b>Conclusion</b>	<p>The verification team confirms that physical features of the nine 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 Remote audit and review of the supporting documentation that physical features of the CPAs have been implemented in accordance with the CPA-DDs/14/. The 8<sup>th</sup> CPA is partially implemented in accordance with CPA-DD. The same was discussed in detail with CME during the verification.</p> <p>The implemented CPAs (i.e. CPA 1 to CPA 9) 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**

>>

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-DDs/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>	CAR#3 has been raised in this context. Refer Appendix 4 of this report for detailed finding.
<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>L_{yy}</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-DDs/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 all the CPAs included under the current monitoring period was already accepted 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 01/29/. The seven CPAs included under the current verification are applied with the version 01 of the Tool 30 "Calculation of fraction of non-renewable biomass"/29/ 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 /29/ respectively.</p> <p>The input value used in the calculation are sourced from survey conducted by the Regional Centre for Information &amp; Research named "CEDII", which was further validated and accepted by host country DNA in Madagascar/31/. The CME has submitted the DNA approved "<math>f_{NRB}</math> value calculation" /30/ conducted by "CEDII"/31/. Based on review of this approved Report/31/ 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. All the nine CPAs included under the current monitoring period of the PoA are under the region "Haute Matsiatra" as confirmed through distribution database; hence <math>f_{NRB}</math> value used for ER calculation is applicable for all the CPAs. The calculation and formulae provided in the report are found to be correct and accordance with the Tool 30 version 01/29/. Thus the assessment team has confirmed that the <math>f_{NRB}</math> value for the 9 CPAs is found to correctly applied as 0.966 in accordance to AMS II G version 09 para 39 (a) and Tool 30</p>
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"Calculation of fraction of non-renewable biomass" version 01.

**2. Data/Parameter, Unit:  $NCV_{biomass}$ , TJ/ tonne**

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.

**3. Data/Parameter, Unit:  $\eta_{old}$ , Fraction**

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.

**4. Data/Parameter, Unit:  $EF_{projected\_fossilfuel}$ ,  $TCO_2/TJ$**

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.

**5. Data/Parameter, Unit:  $L_y$ , Fraction**

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.

**6. Data/Parameter, Unit: Life Span, Number of years**

Description: Operating life time of the ICS (i.e. SaoRehitra & Lamasinina)

Verified Value: 5.5 (for SaoRehitra) and 15 (for Lamasinina)

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.

**7. Data/Parameter, Unit:  $B_{old,HH}$ , tonnes/household/year**

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.

The verification team has further cross checked this value for  $B_{old}$  from the "Baseline Survey Report conducted by CEDII (Regional Center of Documentation and Information)" /32/. The survey was conducted at the time of validation by the independent third party CEDII covering various sample households across the administrative regions in the entire province of Fianarantsoa. There are four regions viz. Haute Matsiatra, Atsimo Atsinanana, Vatovavy Fitovinany and Amoron'i Mania regions which are covered in the survey. The assessment team has verified from the registered CPA locations and from the distribution database of the CPAs that all the CPAs included under the PoA during the current monitoring period is implemented within the region of "Haute Matsiatra". The assessment team has cross checked the location related information from the section 2.3 & 3.2 of the survey report and results are referred from the section 3.19 of the survey report which clearly specifies that

	<p>baseline fuel consumption value (i.e. value for the parameter <math>B_{old}</math>) is representative of the entire regions that are included in the survey. The assessment team has also found that this value has been further accepted and approved by the host country DNA. Hence the value of the parameter <math>B_{old}</math> is applicable for all the CPAs.</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.          The value of <math>B_{old,i,j}</math> is applicable for all the CPAs, as described above. (The number of ICS distributed per household is 1 as verified from the ex-post parameter <math>N_{d,HH}</math>).</p>
<b>Findings</b>	CAR#5 has been raised, refer to Appendix 04 for details of this verification report.
<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

Means of verification	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:	
	1. Data/Parameter, Unit: $N_{y,i,j}$ , <b>Number of units</b> Description: Number of project devices of type $i$ and batch $j$ operating during year $y$	
	Measuring /Reading /Recording frequency	<p>The monitoring frequency is at least once every two years in the CPA-DD and PoA-DD/14/. In accordance with that 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. CME has referred the sampling survey conducted in the month of November 2019, which was taken based on 95/10 confidence level and precision.</p> <p>As per PoA-DD/14/ the required confidence level and precision for sampling is 95/10.</p>

	Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	The §36 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 total 9CPAs were sampled under two sampling frames (as discussed under section C.2) and both the samples are considered as per 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?	There were two sample frames, one is for SaoRehitra Portable ICS (covered under CPA 1, 2, 3, 4, 6, 7 & 9) and other one is for Lamasinina fixed ICS (covered under CPA 5 & 8). The calculated sampling size was based on 95/10 confidence/precision, a

			<p>total of 43 samples were surveyed for this particular parameter <math>N_y</math> from each sample frame. Additionally, the survey on 13 &amp; 11 samples selected for parameter <math>\mu_y</math> also included the inspection for <math>N_y</math> by default. Assessment team reviewed that all these samples were proportionately selected from the respective CPAs (in proportion of their ICS quantities) to consider a representative and unbiased sample selection to derive the results. The project ICS were found to be operational without any issue, in all the samples surveyed under both the frame. The regular cooking needs are fulfilled with using the project ICS.</p> <p>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 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 = <math>122,033 * 100\% = 122,033</math></p> <p>Total SaoRehitra ICS = 96,192 Total Lamasinina ICS = 25,841</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 02)/3/ offinal MR (version 02)/2/.</p> <p>The verification team randomly selected 18 samples from sampling frame 1 and 18 samples from sampling frame 2 for DOE's field survey from each of the two sampling frames submitted by CME and found that all the ICS</p>	

		were operational, which confirms the CME's sample survey results. Additionally, verification team has further referred to the spot-check monitoring forms and found that project ICS are operational without any inconsistency.
	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 CME and established during the remote assessment. The verification team has further verified from the distribution database that data records are proper, uniquely identifiable and consistent with the ER and MR.
	<p>2. Data/Parameter, Unit: <b>Date of commissioning of project device <i>i</i> , Date</b>  Description: Actual date of commissioning of the project device <i>i</i></p>	
	Measuring /Reading /Recording frequency	The data is recorded from start date of ICS distribution 09/10/2018 up to 31/05/2020 which is the end date of the current monitoring period. The month wise distribution details are available across all the CPAs are discussed under the section E.2.1 above, which were verified by DOE in the ICS registration database/5/.
	Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes. The PoA-DD and CPA-DDs/14/ follow the continuous recording frequency.
	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 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 registration database/5/and ICS distribution records (i.e. End User's Agreement)/11/ on sample basis. Also, verification team confirmed the same during remote audit from spot-check monitoring forms which are consistent against the sample households against the entry in End User Agreements/11/ and ICS registration database/5/. Verification team hereby confirms that the recorded dates of distribution of ICS in ICS registration Database/5/are correctly reported.</p> <p>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 the same day. Hence, consideration of ICS operation date as the 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 the 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 CME and established during the remote assessment.
	<b>3. Data/Parameter, Unit: <math>\mu_y</math> , 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-DDs/14/ allows the monitoring frequency to be annual or biennial provided confidence level and precision are appropriately considered. In the current monitoring period total nine CPAs are included and sampled in two different sampling frames (as discussed under the section C.2 above)and monitoring frequency is within the second year of the crediting period.CME has consideration 95/10 confidence level and precision, thus it is found to be acceptable and conservative.
	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 previous sampling surveys(The Sampling Survey conducted in the month of Nov 2019 was based on biennial sampling, thus the results are applicable for the current monitoring period. Further justification is included under the section E.3 of the MR) that were conducted by CME at PoA level across the group of the CPAs sampled under the two sampling frames (as discussed under the section C.2) which are covered in the current monitoring period. The monitoring of this parameter was done through 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. The value (i.e. fraction) derived from this survey provided the value for the <math>\mu_y</math> is applicable for each CPA.</p> <p>In all, total 24 samples (13 samples from the Sampling Frame 1 and 11 samples from the sampling frame 2) which were proportionately selected from all the CPAs were surveyed for this particular parameter. These are</p>

			<p>the required minimum sample size calculated using the appropriate sampling size equations. 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 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 this report.</p> <p>None of the pre-project stoves found in operation for during the DOE's review and acceptance sampling conducted at time of remote audit. As per CME's survey an adjustment factor for baseline usages has been considered as 100% (or 1). DOE has found that the results are based on the survey data captured during the sampling survey period "11<sup>th</sup> Nov 2019 to 15<sup>th</sup> Nov 2019". DOE has reviewed the survey data and calculation practice demonstrated under the sampling survey excel files/6/ separately submitted for both the sampling frames and found to be in accordance with the prescription of the applied methodology (version 9, AMS II G) and in line with registered sampling plan.</p> <p>Thus, the value for the parameter <math>\mu_y</math> is 1 (or 100%) which is the adjustment factor applied in the ER calculation, which is found to be accurate as also consistent with the DOE's onsite survey results (more details related to this parameter <math>\mu_y</math> are discussed under the section E.3.4.3). Moreover, as per page 14 of the methodology (AMS II G, ver 09) : "If the pre-project devices are decommissioned and no longer used, as determined by the monitoring survey its value is 1.0". This is the case applicable for the current monitoring period.</p>	
		If applicable, has the reported data been cross-checked with other available data?	Yes. The survey results/6/ were checked by the verification team and the applied value was found acceptable. The results are reproducible in the corresponding ER spreadsheet/3/ of final MR/2/.	

		<p>The verification team randomly selected 18 samples from sampling frame 1 and 18 samples from sampling frame 2 for DOE's assessment during remote audit and found that there is no traditional stove is operational along with ICS installed under the CPAs, which confirms the CME's sample survey results are appropriate and conservative. The verification team has further referred to the spot check monitoring forms maintained by CME and found consistent with the informed reported in the MR, which also confirms that there is no baseline or additional stoves available at the households except the project ICS.</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 remote audit 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.
<p>4. Data/Parameter, Unit: <b>N<sub>d,HH</sub>, Number</b>          Description: Number of project devices distributed per household</p>		
	Measuring /Reading /Recording frequency	The data is recorded from start date of ICS distribution 09/10/2018 up to 31/05/2020, 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 during the online assessment and verification. Moreover, the unique serial numbers of the ICS are verified against the distribution database and also from the signed copies of beneficiary registrations, which confirm that only one ICS has been provided to each household under the CPAs. Since ICS serial numbers are uniquely identifiable and ICS distribution records do not have any duplicate numbers or users, hence the value of this parameter can be confirmed as 1. 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 arrive at the value of this parameter were cross-checked by verification team against ICS registration database/5/. There is no 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 remote audit the ICS distribution process,

		record keeping (distribution dates) and process of spot check were reviewed and were found reliable.
	5. Data/Parameter, Unit: $\eta_{\text{new},i,j}$ , <b>Fraction</b> Description: Efficiency of the project device of each type <i>i</i> and batch <i>j</i>	
	Measuring /Reading /Recording frequency	<p>The efficiency of project devices (both for SaoRehitra &amp; Lamasinina) was calculated for the vintage 1 following Water Boiling Test protocol 4.2.4/22/ based on approach 3 of Data/Parameter of the applied methodology, version 09/18/.</p> <p>For the vintage 2, the loss in efficiency has been accounted for both the ICS by applying the adjustment factor in line with para 27(a) of the methodology. The efficiency for vintage 2 and subsequent years are determined by deducting this annual loss % in efficiency.</p>
	Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	<p>Yes. As per CPA-DDs/14/.</p> <p>The value has been measured and reported based on WBT results on a batch of operational ICS during the vintage 1 and for vintage 2 the para 27(a) of the methodology has been applied; which is in accordance with the monitoring plan.</p> <p>The Stove technology (both SaoRehitra &amp; Lamasinina) provider is a reputed organization (Madagascar EcoVision Tsinjoharena Sau) in Madagascar, followed by the local distribution &amp; management team ONG Tandavanala which is a reputed national level NGO. Also the stove design specifications, development and quality etc. are tested and approved by CNRIT Lab (Center National Research Industrial And Technological), Department of Energy, Madagascar who is an independent third party. The WBT tests for ICS models were also conducted by an experienced professional under the entity. Therefore, approach 3 of Data / Parameter table 11 of applied methodology /18/ can be applied for the monitoring of efficiency of the project device.</p>

	Monitoring equipment	<p>Not applicable as value is taken from the third party certified WBT report. The previous WBT test reports are referred (which are still applicable) during the current monitoring period followed by para 27(a) of the methodology to account annual loss in efficiency. This WBT reports also include list of equipment used and their calibration status.</p> <p>The WBT tests were coordinated 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-DDs do not prescribe any specific monitoring equipment but weighing scale, digital moisture meter and digital thermometer were required and used to conduct WBT, as reported by the third party.</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
	Is the accuracy valid for the entire measuring range or do different accuracy levels apply to different measuring ranges?	Yes
	Calibration frequency /interval:	Not applicable as value has been considered from third party 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?	Yes



	Is the calibration of measuring equipment carried out by an accredited person or institution?	Yes
	Is(are) calibration(s) valid for the whole reporting period?	Yes
	Is the calibration carried out for a measuring range comparable with the range for which measurements have been carried out?	Yes
	How were the values in the monitoring report verified?	<p><b>For SaoRehitra ICS:</b> 31.50% (adjusted average value considered for ICSs with operational vintage period 1, which fall under CPA 2, 3, 4, 6, 7, &amp; 9)</p> <p>29.41% (adjusted value considered for ICSs with operational vintage period 2, which fall under CPA 1 &amp; CPA 2)</p> <p><b>For Lamasinina ICS:</b> 31.71% (value considered for ICS in 'vintage period 1' for CPA 5&amp;8)</p> <p><u>Details:</u> For ICS type "SaoRehitra", the operational efficiency for vintage 1 was tested during the first monitoring period on a batch of operational ICS (through a sampling WBT, conducted by a third party agency). This value was 31.50% which is conservative as compared to the value estimated at the time of validation and CPA inclusion (i.e. 32.2%). Therefore, the final value considered for ICS type "SaoRehitra" for the 1<sup>st</sup> vintage is 31.50%.</p> <p>The value of <math>\eta_{new}</math> for subsequent vintages (i.e. for vintage 2, applicable for few ICS during the current monitoring period) was calculated as per the provision of para 27(a) of the applied methodology (version 09). Therefore, the loss in yearly efficiency has been calculated considering the base efficiency of vintage-1 as 31.5%. Thus, the value resulted for 'vintage 2' is 29.41% which is applied in the ER calculation.</p> <p>For the ICS type "Lamasinina", the same practice has been adopted. The Lamasinina ICS was not part of first monitoring period. It has been included under the CPA #5 &amp; CPA #8 where CPA #5 was included during the 2<sup>nd</sup> monitoring period and CPA #8 was included during the current monitoring period. CME has considered the operational efficiency tested during the 2<sup>nd</sup> monitoring period on a batch of operational ICS through a sampling WBT, which was conducted by a third party agency. This WBT was for the</p>

		<p>purpose of measuring the <math>\eta_{new}</math> value for Lamasinina ICS operational in the year 1. The resulted value was 31.71% which was conservative as compared to the value estimated at the time of CPA inclusion (i.e. 33%), therefore CME had considered conservative approach and hence the applied value for any ICS type "Lamasinina" for the 1<sup>st</sup> vintage is 31.71%. The applicable value for subsequent vintages shall be derived applying the para 27(a) of the methodology) as confirmed and reported by CME.</p> <p>The reported values were checked with the actual WBT results obtained from test conducted by the professional from CNRIT Lab, Department of Energy, Madagascar/6/ and found consistent. The calculated value as per para 27(a) of the methodology has been demonstrated by CME under the ER sheet and found to be correct.</p> <p>The sample survey approach is included under Section E.3.4.3 of this report. The detailed calculation of sample data, results and adjusted final values are reported under the sampling sheet, which are further verified from primary records during the remote audit.</p> <p>Thus, the verified value of <math>\eta_{new}</math> for SaoRehitra is 31.50% and 29.41% for vintage 1 &amp; vintage 2 respectively and that for Lamasinina is 31.71% for vintage 1. During the current monitoring period, there is no Lamasinina ICS that is operational under vintage 2. The vintage wise numbers of ICS across all CPAs are verified from the distribution database and are further referred under Appendix 1 of the MR and ER sheet. The reported values are found to be consistent with the previous monitoring report, test results, certified WBT report. Also the approach and application of this parameter found to be conservative and appropriate.</p>	
	<p>If applicable, has the reported data been cross-checked with other available data?</p>	<p>Not applicable.</p> <p>The values are based on actual WBT tests conducted at standard conditions and conducted by experienced professional, thereafter further adjusted for loss in efficiency as per para 27(a) of the methodology, therefore approach is in line with registered monitoring plan and in accordance with the applied methodology, hence considered acceptable.</p>	

	<table border="1" data-bbox="501 152 1418 705"> <tr> <td data-bbox="501 152 852 705">Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?</td><td data-bbox="852 152 1418 705"> <p>The value is used from the third party reports, hence there is no QA/QC process involved.</p> <p>However, based on the desk review and interactions during remote audit 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 4.2.3 (WBT spreadsheet 4.2.4) /22/ was applied, which is acceptable. Moreover, the previous WBT tests on the selected samples which was conducted by experienced professional and results were verified and certified by a third party "CNRIT Lab, Department of Energy, Madagascar"; which itself confirms the reliability and quality of the WBT practice.</p> </td></tr> </table> <p>6. One of the monitoring parameters "<b>Date of commissioning of batch j</b>" as mentioned in the CPA-DD/14/ has not been monitored by CME separately, since CME records date for commissioning for each individual ICS and these dates are properly maintained in the distribution database. For the purpose of ER 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 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. Whereas, for the purpose of identification of ICS numbers vintage-wise, the year fraction for each ICS has been calculated from the date of its distribution which are recorded individually for each ICS in the distribution database. 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 entire batch. These dates are available to cross check from the beneficiary agreements signed at the time of distribution and still available a copy with the beneficiaries at their houses and another back copy with the CME.</p> <p>Moreover, from the remote audit DOE confirms that the production of particular type of ICS (i.e. SaoRehitra) and development &amp; commissioning of fixed stove (i.e. Lamasinina) at identified households are based on a continuous process, which means there is no batch-wise production. DOE also verifies this based on previously conducted site visits. Similarly distribution and commissioning 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). In this regard, the 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 practice adequately addresses the requirement of the parameter "<b>Date of commissioning of batch j</b>" and DOE finds this to be the most conservative approach and hence justifies the particular parameter.</p>	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	<p>The value is used from the third party reports, hence there is no QA/QC process involved.</p> <p>However, based on the desk review and interactions during remote audit 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 4.2.3 (WBT spreadsheet 4.2.4) /22/ was applied, which is acceptable. Moreover, the previous WBT tests on the selected samples which was conducted by experienced professional and results were verified and certified by a third party "CNRIT Lab, Department of Energy, Madagascar"; which itself confirms the reliability and quality of the WBT practice.</p>
Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	<p>The value is used from the third party reports, hence there is no QA/QC process involved.</p> <p>However, based on the desk review and interactions during remote audit 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 4.2.3 (WBT spreadsheet 4.2.4) /22/ was applied, which is acceptable. Moreover, the previous WBT tests on the selected samples which was conducted by experienced professional and results were verified and certified by a third party "CNRIT Lab, Department of Energy, Madagascar"; which itself confirms the reliability and quality of the WBT practice.</p>		
<b>Findings</b>	CAR#4 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-DDs/14/. The monitoring system follows the information flow for the parameters as mentioned in monitoring plan in registered PoA-DD and registered CPA-DDs/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-DDs/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>  CME has followed the sampling plan as prescribed under the registered PoA-DD, section I.7.2. As per the same, the share of operating stoves and the continued use of pre-project devices are determined based on sampling procedures.</p> <p>CME has applied the provision of “General Guidelines for SSC CDM Methodologies”, version 23.0, para 27 and 28. The results of the biennial sampling survey previously conducted in the month of November 2019 have been used for the current monitoring period. During this sampling, total 7 CPAs were included and out of them 6 CPAs received distribution whereas 7<sup>th</sup> CPA distribution was supposed to be started. The information and results are reported under the MR in line with the same.</p> <p>The verification team has checked that 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/. The sampling design has been referred to all the nine CPAs (i.e. CPA-0001, 0002, 0003, 0004, 0005, 0006, 0007, 0008 &amp; 0009) that were implemented under the current monitoring period. However, during the sampling survey in November 2019, two different sampling frames were designed for the two ICS models “SaoRehitra” (Frame 1) and “Lamasinina” (Frame 2). Therefore, the CPA-0005 &amp; CPA 0008 are specific to the sampling Frame 2 and other CPAs are specific to the sampling Frame 1. The required sampling size was calculated separately for both the sampling frames. The CME applied 95/10 for sampling option for both the sampling frames. And samples were selected proportionately from all CPAs such that 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 was considered during the sampling survey in November 2019. Thereafter, ICS/households present in various locations were randomly selected as per the outcome of sampling size calculation for respective parameter across the two sampling frames and for sampling frame 1 (i.e. was specific to SaoRehitra ICS covered under CPA 1<sup>st</sup> to 4<sup>th</sup> and 6<sup>th</sup> during the sampling, where as distribution under 7<sup>th</sup> CPA was not started during that time) the total sample size was proportionately broken up for each CPAs considering the ratio of ICS distributed under the CPAs. Since the ICSs are of same type and the end beneficiaries are homogenous (i.e. baseline with three stone open fire) therefore, simple random sampling is justified. Similarly, sampling frame 2 was specific to CPA-0005 which covers only the fixed ICS type Lamasinina. Thus, simple random sampling is suited for this frame as well. During the current monitoring period, 2 CPAs are additional (i.e. 8<sup>th</sup> &amp; 9<sup>th</sup>) as compared to the number of CPAs (i.e. 7 CPAs) included during the time of sampling survey in November 2019. The CPA-0008 includes Lamasinina fixed ICS and CPA-0009 includes SaoRehitra portable ICS. Since the technologies are similar and the beneficiaries are homogeneous fall under the same region ‘Haute Matsiatra’, therefore applicability of the sampling results across all 9 CPAs are acceptable.</p>
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**Sample Size (Required and Actual) for Parameter of Interest:**

The sampling was/isapplied to the following monitoring parameters:

$N_{y,i,j}$ : Number of project devices of type i and batch j operating during year y

$\mu_y$ : Adjustment to account for any continued use of pre-project devices during the year y

Also, an additional sampling was conducted for the parameter “efficiency ( $\eta_{new,i,j}$ )” of the project ICS type Lamasinina, which was calculated based on sampling Water Boiling Tests (WBT). The purpose of consideration of WBT sampling was to measure the  $\eta_{new}$  value for the ICS operational in the 1<sup>st</sup> year of operation as compared to value available at the time of CPA inclusion. The ICS type Lamasinina has been included under the CPA-5 during the 2<sup>nd</sup> monitoring period and CPA-8 is during the current monitoring period.

The representative sampling was undertaken as part of a PoA-wide Sampling Plan (by grouping and sampling across the CPAs in under two sampling frames as discussed above) that was 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 parameter has been calculated based on 95/10 confidence/precision which suffices for annual sampling.

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

Under both the sampling frames, the sample size was determined for the total population of stoves for  $N_{y,i,j}$  and  $\mu_y$  both being proportional value. Also, efficiency of the project ICS ( $\eta_{new,i,j}$ ) is a monitoring parameter, which was calculated based on sampling Water Boiling Tests (WBT) for the ICS in vintage 1, followed by application of para 27(a) of the methodology to account annual loss in efficiency.

$N_{y,i,j}$  : Visual inspection of the premises to see if ICS is operational and in use. Interview with enduser 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.

The verification team has checked the survey forms and the reports submitted during the verification process. The team is of the opinion that that the surveys were designed and data collected according to the requirements of the methodology and in line with the sampling guidelines. 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 95/10 confidence/precision was 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 two sample size calculation excel sheets/4/ submitted by CME and is found to be correct)

However in case of sampling frame 1, since the total population was combination of 6CPAs (7<sup>th</sup> CPA distribution was not started at the time of sampling survey in November 2019) with SaoRehitra ICS, therefore the sample size of this sample frame is proportionately distributed for each CPA and a total sample size of 43 has been selected proportionately. The calculation of sample size has been verified from the sample survey sheet. In case of sampling frame 2, similar approach was taken and this sample size is 43 which are randomly selected from the CPA-005.

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

$$n \geq 4, \text{ i.e. } n = 4.$$

Since the calculated sample size was found to be less than 30, therefore, CME applied t-Distribution to have an adjusted sample size. After applying the t-Distribution, the adjusted sample size was found to be 11. Therefore, in this case a sample size of 11 was supposed to be sampled from the primary sampling unit. However, since the total population is combination of 6CPAs, therefore the sample size of the sample frame is proportionately distributed for CPAs and rounded up values have been considered to ensure a proportionate selection from each CPA in the frame, which resulted a total sample size of 13. The calculation of sample size has been verified from the sample survey sheet. In case of sampling frame 2, this sample size is 11 from CPA-0005.

Similarly, the required sample size calculation was conducted for the parameter,  $\eta_{\text{new}}$ , for Lamasinina ICS under sampling frame 2. Since sample size calculated was below 30, so t-Distribution was applied to adjust the sample which resulted into a sample size of 11 for the sampling frame 2. The details of calculation, sample selection, sample data, results all were transparently referred in the sample survey sheets. The data and results were verified from the primary sampling data collection sheets and also randomly verified during the remote assessment.

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

Parameter	Sample size calculated (for Sampling Frame 1)	Sample size calculated (for Sampling Frame 2)
$N_{y,i,j}$	43	43
$\mu_{y,i,j}$	13	11
$\eta_{\text{new},i,j}$	NA	11

The sample size calculation spreadsheets/4/ were checked and found correct as per registered monitoring plan mentioned in CPA-DDs/14/. The previous monitoring report is also referred here for further verification purpose.

It has been observed that the sampling requirements were met for all the stoves. The actual surveyed ICS were equal to the required number, as mentioned above. As these were based on sampling approach, hence respective reliability of precision was checked for each parameter using the specific formula in line with the Sampling Guideline (version 04) and Sampling Standard (version 07); and found the results to be within the prescribed limits (<10%).

#### **Sample selection:**

The CME has considered selection of samples based on Random selection; and for such random selections an online randomizer was 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 to confirm that the same samples were surveyed/tested during the monitoring survey conducted for this verification. There was no non-response in any of the samples, and sampling results were found to be within the prescribed precision range during the reliability check. Hence re-sampling or over-sampling was not required.

The random sample selection has been verified by the verification team from the sample size calculation sheets/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 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 the premises to see if project ICS is operational and in use.

**For parameter  $\mu_y$ :** As confirmed from the sampling survey sheet/4/, the CME designed the survey by adopting sampling approach in accordance with the page 14 option 2 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. However survey confirmed that there was no existence of any baseline stove that was operational along with the project ICS. Thus, it eliminates the risk of any probable continued use of baseline stove at project scenario. The CME has submitted the sampling survey excels (separately for both the sampling frames), with detailing of the calculation practice from the survey data, and also the primary data collection sheets. All details are consistent and are found reliable during DOE's remote audit observation.

#### **For parameter $\eta_{new}$ :**

This parameter was tested based on sampling only specific to the Lamasinina ICS operational in their vintage 1. As confirmed from the sampling survey sheet/4/, the result of this parameter was drawn based on the previous Water Boiling Test (WBT) conducted on the selected samples. The WBT assessment sheets were checked during the remote audit and found to be consistent with the data and results included in the sampling sheets. WBT tests were conducted by an experienced professional, by following standard requirements of WBT protocol. For each stove sample all three required tests of Cold Start, Hot Start and Simmer performed using pre-calibrated equipment and values were properly reported and certified by the expert under 'National Centre of Industrial and Technological Research of the Ministry of Higher Education and Scientific Research of

Antananarivo, Madagascar.

The verification team is able to confirm that the objective of considering this parameter for sampling was to derive the value of efficiency from the actual ICS (Lamasinina) samples operational in the 'vintage 1'. The WBT was conducted by a third party as per WBT protocol, the result was compared with the efficiency value considered at the time of CPA inclusion and found to be conservative. Hence this result is considered as the ex-ante fixed value for the ICS type in 'vintage 1'. The details are verified from the section E.2 of the MR and further referred in the ER sheet.

#### Reliability and precision calculation:

The verification team has verified the sample size calculation spreadsheets/4/ with the monitored data, where the actual achieved precision is calculated against the Guidelines outlined under "Standard for sampling and surveys for CDM project activities and programme of activities" (version 07, which was used in the registered monitoring plan in the PoA-DD and respective CPA-DDs)/23/ and can confirm that the calculation of achieved reliability was done correctly. The verification team confirmed from the sample size calculation spreadsheets/4/ that the required precision was kept <10% during sample size calculation. The equations used for reliability and precision calculation are specified by CME under the "Sampling Survey\_Sampling Frame-I\_final (Dec 2019)" & "Sampling Survey\_Sampling Frame-II\_final (Dec 2019)" respectively.. The same are also included under the Appendix 2 of the MR (ver 02, dated 12/08/2020).

#### 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 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

**For sampling Frame 1 (i.e. for SaoRehitra ICS):**

Parameter	Value	Source/ basis
Population Size	59936	ICS registration database (Number of stoves registered in database till 31/10/2019)
Sample Size	43	Calculated value by CME for sample size calculation.

**For sampling Frame 2 (i.e. for Lamasinina fixed ICS):**

Parameter	Value	Source/ basis
Population Size	5000	ICS registration database (Number of stoves registered in database till 31/10/2019)
Sample Size	43	Calculated value by CME for sample size calculation.

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.

**For sampling Frame 1 (i.e. for SaoRehitra ICS):**

Parameter	Value	Source/ basis
$N_{y,i,j}$	43	Actual sample size surveyed
Overall Proportion	1.00	Actual value
Confidence Level	1.96	95% confidence level
Precision achieved	0.0%	Calculated
Is required precision achieved?	Yes	< 10%

**For sampling Frame 2 (i.e. for Lamasinina ICS):**

Parameter	Value	Source/ basis
$N_{y,i,j}$	43	Actual sample size surveyed
Overall Proportion	1.00	Actual value
Confidence Level	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 spreadsheets/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 Spreadsheets/4/ corresponding to final Monitoring Report/2/, which were also found correct.

Table – Actual Precision Achieved based on Survey results:

**For sampling Frame 1 (i.e. for SaoRehitra ICS):**

(Ref: "Sampling Survey\_Sampling Frame I (CPA1-4 and 6)\_final (Dec 2019)-revised")

Monitoring Parameter	Precision Achieved	Is required Precision achieved? (< 10%)
$N_{y,i,j}$	0%	Yes
$\mu_{y,i,j}$	0%	Yes

**For sampling Frame 2 (i.e. for Lamasinina Fixed ICS):**

(Ref: "Sampling Survey\_Sampling Frame II (CPA5)\_final (Dec 2019)")

Monitoring Parameter	Precision Achieved	Is required Precision achieved? (< 10%)
$N_{y,i,j}$	0%	Yes
$\mu_{y,i,j}$	0%	Yes
$\eta_{new,i,j}$	1.34%	Yes

The sampling calculations, survey data, results and reliability check etc. are properly demonstrated under the sampling survey excel files/4/. Based on the verified results the verification team found that the required precision is met in line with the requirements in all the cases; and therefore the survey results/4/ were directly used in the calculation of ERs.

Also, the verification team has verified the sampling calculation, results and precision derived from the sampling etc. against the Sampling Standard and also referred to "Best Practice Example" in the sampling guidelines. 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 in each sampling frame. This has also fulfilled the requirement of the para 24 of the sampling standard (version 7).

**Applicability of Sampling Results in the current monitoring period:**

CME has conducted a Sampling Monitoring Survey and WBT in the month of November 2019 (4<sup>th</sup>Nov to 15<sup>th</sup>Nov 2019), where 95/10 confidence precision was applied considering a biennial inspection. The results of that sampling survey were applied during the 2<sup>nd</sup> monitoring period which was "01/06/2019 to 31/10/2019". Therefore, CME has further applied the results for the current monitoring period.

In this regard, the verification team reviewed that the monitoring frequency for two parameters  $N_y$  &  $\mu_y$  are prescribed as once in two years. For WBT monitoring frequency is prescribed as at least once in a year and the yearly efficiency of ICS will be calculated after adjusting the loss in efficiency as per para 27 (a) of AMSII.G Version-09.0. Therefore, results from the biennial sampling were acceptable for the current monitoring period.

The verification team has referred to the para 27 & 28 of the "General Guidelines for SSC CDM Methodologies", version 23.0 for further verification. The team has confirmed that –

- (i) the total ICS included under the 9 CPAs are of same technologies that are included during the last sampling survey under the two sampling frames,
- (ii) the average lifetime of the two ICS models are known and are more than 4 years (5.5 years for SaoRehitra & 15 years for Lamasinina, as tested certified by CNRIT),

	<p>(iii) the oldest ICS operational under the PoA is also within the 2<sup>nd</sup> vintage year of operation,</p> <p>(iv) all the households covered under the CPAs are homogeneous in terms of their cooking habits and overall household conditions etc., hence representative to the sampling surveys conducted during Nov 2019,</p> <p>(v) 100% distributed ICS are in operation, without any failure, which was resulted from the previous two consecutive sampling surveys and also observed from spot-check monitoring adopted by CME, and</p> <p>(vi) the ICS models are locally manufactured, distributed and commissioned, there are dedicated local resources to conduct inspection, service maintenance etc. on regular basis.</p> <p>All these above points are properly verified based on supporting documents and as per assessment done during the remote audit. The information is properly reported by CME under the section E.3 of the MR and also under the Appendix 2.</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 sampling survey carried out by CME is in accordance with §24 of Standard for “Sampling and surveys for CDM project activities and programmes of activities” (version 07)/23/. Therefore, verification team is able to confirm that sampling plan applied and results used for ER calculation are acceptable.

### 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. Moreover, the WBT samplings conducted for the ICS with operational vintage 1 were done by experienced professional, verified and certified by third party agencies. For results, the third party verified reports were referred. Hence, no separate calibration procedure is applicable.</p> <p>However, the list of equipment and their calibration details were included under the WBT reports. The verification team enquired and verified information with regard to those monitoring equipment that were used to conduct the parameter “Efficiency of the project device of each type <i>i</i> and batch <i>j</i>” and found that all equipment are pre-calibrated and well maintained.</p> <p>The verification team has verified the following information from the reports:</p> <p><b>For sampling Frame 1 (i.e. for SaoRehitra ICS):</b> Referred from the WBT report during the 1<sup>st</sup> monitoring period.</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> </ul> </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> </ul>
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Thermometer	<ul style="list-style-type: none"> <li>✓ °C select</li> <li>✓ Hold function</li> <li>✓ With tubular case</li> </ul>						

	<ul style="list-style-type: none"> <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 (Temptec 4 In 1)	<ul style="list-style-type: none"> <li>✓ Measurable Temperature Range : -50c ~ +70c ; -58°F ~ +158°F ( C/F selectable)</li> <li>✓ Relative Humidity Measure Range : 20%~90%</li> <li>✓ 3meter external outdoor sensor cord</li> <li>✓ Clock Function</li> <li>✓ Foldable Stand &amp; Wallmountable</li> <li>✓ Lcdsize : 41mm x 60mm</li> <li>✓ Make Year: 2019</li> <li>✓ Calibration: NA (new device)</li> </ul>
Pot (Ambatolampy)	<ul style="list-style-type: none"> <li>✓ Depth : about 11cm</li> <li>✓ Ø : about 24cm</li> <li>✓ Thickness : about 0.7cm</li> <li>✓ Weight : about 700gr to 750gr</li> <li>✓ Material : ferrous allumino</li> <li>✓ Calibration: NA</li> </ul>
Tape Measure	<ul style="list-style-type: none"> <li>✓ the measuring range is 60 inches/ 150 cm (dual sided),</li> <li>✓ Easy to read</li> <li>✓ Good sewing tool: a flexible measuring tape</li> <li>✓ Calibration: NA</li> </ul>

**For sampling Frame 2 (i.e. for Lamasinina ICS):**Referred from the WBT report during the 2<sup>nd</sup> monitoring period.

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 (Temptec 4 In 1)	<ul style="list-style-type: none"> <li>✓ Measurable Temperature Range : -50c ~ +70c ; -58°F ~ +158°F ( C/F selectable)</li> </ul>

		<ul style="list-style-type: none"> <li>✓ Relative Humidity Measure Range : 20%~90%</li> <li>✓ 3meter external outdoor sensor cord</li> <li>✓ Clock Function</li> <li>✓ Foldable Stand &amp; Wallmountable</li> <li>✓ LCD size : 41mm x 60mm</li> <li>✓ Make Year: 2019</li> <li>✓ Calibration: NA (new device)</li> </ul>
	Pot (Ambatolampy)	<ul style="list-style-type: none"> <li>✓ Depth : about 11cm</li> <li>✓ Ø : about 24cm</li> <li>✓ Thickness : about 0.7cm</li> <li>✓ Weight : about 700gr to 750gr</li> <li>✓ Material : ferrous allumino</li> <li>✓ Calibration: NA</li> </ul>
	Tape Measure	<ul style="list-style-type: none"> <li>✓ the measuring range is 60 inches/ 150 cm (dual sided),</li> <li>✓ Easy to read</li> <li>✓ Good sewing tool: a flexible measuring tape</li> <li>✓ Calibration: NA</li> </ul>
<p>For the sampling frame 2, all equipment's listed above were used between 04/11/2019 to 15/11/2019 i.e., which means 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. Similar was the condition and status of equipment that were used for SaoRehitra ICS during the first monitoring period.</p> <p>CME has submitted the certified copies/08/ of the list of equipment along with the calibration details confirming the method and protocols used for WBT for both the ICS types. 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>	No finding has been raised.	
<b>Conclusion</b>	<p>The verification team confirms 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.</p>	

### 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:</p> <p><i>i</i> = Indices for the situation where more than one type of project device is introduced to replace the pre-project devices.</p> <p><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</p> <p>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</p> <p>LE<sub>y</sub> = Leakage emissions in the year <i>y</i></p> <p>In the existing CPAs, two different types of project stove are distributed as demonstrated</p>
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under the sections above

$$ER_{yv} = B_{y,saving} \times N_y \times f_{NRB,yv} \times \mu_y \times NCV_{biomass} \times EF_{projected\_fossilfuel}$$

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 options 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 each CPA separately – one particular calculation is for ICS Type SaoRehitra based on the WBT value derived from the sampling frame-1 which is applicable for the CPA-0001, 0002, 0003, 0004, 0006 & 0007; whereas other calculation is based on the WBT value derived from the sampling frame-2 which is applicable for the CPA-0005 & 0008. Additionally, the efficiency for vintage 1 & vintage 2 ICS are different. Hence the equation was used for calculation for both the vintages w.r.t. their  $\eta_{new,i,j}$  values.

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 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 CPAs has been categorized under their respective vintages based on their age accounted from the date of distribution.

This is summarized in the table below;

#### For ICS type SaoRehitra (or SR ICS)

Date of the 1 <sup>st</sup> stove (SR ICS) included under this monitoring period:	09-Oct-2018	Refer to the respective CPA Distribution sheets
Date of last stove (SR ICS) included under this monitoring period:	15-May-2020	
Thus, the total number of stoves included in current MP having their operational vintage 1:	73,443	
Thus, the total number of stoves included in current MP having their operational vintage 2:	22,749	

#### For ICS type Lamasinina (or fixed ICS)

Date of the 1 <sup>st</sup> stove included under this monitoring period:	15-Jul-2019	Refer to the respective CPA Distribution sheets
Date of last stove included under this monitoring period:	15-May-2020	
Thus, the stoves included in current MP having their operational vintage 1:	25841	

	Thus, the stoves included in current MP having their operational vintage 2:	0	
	The information has been verified from the ICS distribution database and also the summarized details in the corresponding ER sheet/3/ and the final Monitoring Report/2/. Thus, DOE has concluded the ER calculation is accurate, reliable and conservative.		
<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) 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 Monitoring Report /2/;</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 were followed;</li> <li>d) All assumptions used in the emission calculations were found appropriate and therefore justified;</li> <li>e) 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>f) 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> </ul>		

### 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 remote audit 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,i}</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</math> x <math>f_{NRB,y}</math> x <math>\mu_y</math> x <math>N_{CV_{biomass}}</math> x <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>
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<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) 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 Monitoring Report /2/;</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 leakage GHG emissions were followed;</li> <li>d) All assumptions used in the emission calculations were found appropriate and therefore justified;</li> <li>e) 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>f) 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> </ul>

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

<b>Means of verification</b>	<p>As elaborated above, the emission reductions from the PoA were based on baseline emissions minus leakage emissions. The calculations presented in this 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-DDs/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 143,301tCO<sub>2e</sub>.</li> </ul>



CPA UNFCCC reference number	Baseline GHG emissions or baseline net GHG removals (t CO <sub>2</sub> e)	Project GHG emissions or actual net GHG removals (t CO <sub>2</sub> e)	Leakage GHG emissions (t CO <sub>2</sub> e)	GHG emission reductions or net anthropogenic GHG removals (t CO <sub>2</sub> e)		
				Before 01/01/2013	From 01/01/2013	Total amount
<b>CPA 10443-P1-0001-CP1</b> Madagascar Improved Cookstove Project by KCM-Wood#CPA-W-001	20,993	0	0	0	20,993	20,993
<b>CPA 10443-P1-0002-CP1</b> Madagascar Improved Cookstove Project by KCM-Wood#CPA-W-002	21,559	0	0	0	21,559	21,559
<b>CPA 10443-P1-0003-CP1</b> Madagascar Improved Cookstove Project by KCM-Wood#CPA-W-003	21,615	0	0	0	21,615	21,615
<b>CPA 10443-P1-0004-CP1</b> Madagascar Improved Cookstove Project by KCM-Wood#CPA-W-004	21,825	0	0	0	21,825	21,825
<b>CPA 10443-P1-0005-CP1</b> Madagascar Improved Cookstove Project by KCM-Wood#CPA-W-005	19,312	0	0	0	19,312	19,312
<b>CPA 10443-P1-0006-CP1</b> Madagascar Improved Cookstove Project by KCM-Wood#CPA-W-006	19,860	0	0	0	19,860	19,860
<b>CPA 10443-P1-0007-CP1</b> Madagascar Improved Cookstove Project by KCM-Wood#CPA-W-007	13,177	0	0	0	13,177	13,177
<b>CPA 10443-P1-0008-CP1</b> Madagascar Improved Cookstove Project by KCM-Wood#CPA-W-008	2,269	0	0	0	2,269	2,269

<b>CPA 10443-P1-0009-CP1</b> Madagascar Improved Cookstove Project by KCM-Wood#CPA-W-009	2,691	0	0	0	2,691	2,691
<b>Total</b>	143,301	0	0	0	143,301	143,301

### 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 Monitoring Report (version 02)/2/, the actual emission reductions achieved (143,301tCO <sub>2</sub> e) by the nine CPAs that are included in the current monitoring period is found to be lesser than the ex-ante estimated quantity of ERs in the respective CPA-DDs/14/ for the comparable period(i.e. 213 days).
<b>Findings</b>	No finding has been raised.
<b>Conclusion</b>	The actual emission reductions achieved by the CPAs is lesser (4.63% for CPA 1, 2.65% for CPA 2, 2.40% for CPA 3, 1.45% for CPA 4, 12.80% for CPA 5, 10.32% for CPA 6, 40.50% for CPA 7, 64.22% for CPA 8 and 57.57% for CPA 9) than the estimated quantity of ERs in the respective CPA-DDs/14/. The same was verified in the ER sheet and the reason of decrease in ERs has been reported by DOE under section 3.6.6 of this report.

CPA UNFCCC reference number	Amount achieved during this monitoring period (t CO <sub>2</sub> e)	Amount estimated ex ante for this monitoring period in the CPA-DD (t CO <sub>2</sub> e)
CPA 10443-P1-0001-CP1	20,993	22,013
CPA 10443-P1-0002-CP1	21,559	22,146
CPA 10443-P1-0003-CP1	21,615	22,146
CPA 10443-P1-0004-CP1	21,825	22,146
CPA 10443-P1-0005-CP1	19,312	22,146
CPA 10443-P1-0006-CP1	19,860	22,146
CPA 10443-P1-0007-CP1	13,177	22,146
CPA 10443-P1-0008-CP1	2,269	6,342
CPA 10443-P1-0009-CP1	2,691	6,342
<b>Total</b>	143,301	167,575

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

<b>Means of verification</b>	There is no increase in actually achieved emission reductions as compared to estimated reduction for a comparable period, whereas actual active reductions are lesser than the estimated ex-ante value for equivalent period (i.e. 14.49% lesser than ex-ante estimated value for the monitoring period). This is mainly because of partial distribution of ICS under the CPA-0008 and lower year fraction for ER calculation achieved during the current monitoring period for CPA-0008 & 0009. The details of distribution can be referred from the ER sheet and respective distribution database for the CPAs.
<b>Findings</b>	No finding has been raised.
<b>Conclusion</b>	The actual emission reductions achieved by the 9CPAs is lesser (14.49% in cumulative to all the CPAs) 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 MR/2/. Therefore, it is accepted by the verification

	team.
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**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 third independent verification of the emission reductions for the registered CDM PoA 10443 "Madagascar Improved Cookstove Project by KCM" in Madagascar for the monitoring period 01/11/2019 – 31/05/2020 (including both days) was reported in the Monitoring Report (public) Version 01 dated 25/06/2020/1/. 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 all the nine CPAs/14/ (i.e. UNFCCC Reference: CPA 10443-P1-0001-CP1, CPA 10443-P1-0002-CP1, CPA 10443-P1-0003-CP1, CPA 10443-P1-0004-CP1, CPA 10443-P1-0005-CP1, CPA 10443-P1-0006-CP1, CPA 10443-P1-0007-CP1, CPA 10443-P1-0008-CP1, CPA 10443-P1-0009-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 all these 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 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 02 and ER version 02) are revised and finalized.

As a result, it is confirmed that the emission reductions as 143,301tCO<sub>2</sub>e from the CDM PoA 10443 "Madagascar Improved Cookstove Project by KCM" are correctly reported in the Monitoring Report Version 02, dated 12/08/2020 and corresponding ER spreadsheet (version 02, dated 12/08/2020) for the monitoring period 01/11/2019 – 31/05/2020 (including both the dates). 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 01/11/2019 –31/05/2020 (including both dates) are fairly stated in the Monitoring Report (final) Version 02, dated 12/08/2020.

Applus+ Certification, based on outcome of verification activities, certify in writing that, during the monitoring period 01/11/2019 –31/05/2020(including both dates), the registered CDM PoA10443“Madagascar Improved Cookstove Project by KCM” and the nine included CPAs(i.e. UNFCCC Reference: CPA 10443-P1-0001-CP1, CPA 10443-P1-0002-CP1, CPA 10443-P1-0003-CP1, CPA 10443-P1-0004-CP1, CPA 10443-P1-0005-CP1, CPA 10443-P1-0006-CP1, CPA 10443-P1-0007-CP1, CPA 10443-P1-0008-CP1 and CPA 10443-P1-0009-CP1) in the registered CDM PoA achieved the verified amount of 143,301tCO<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	20,993
CPA 10443-P1-0002-CP1	NIL	21,559
CPA 10443-P1-0003-CP1	NIL	21,615
CPA 10443-P1-0004-CP1	NIL	21,825
CPA 10443-P1-0005-CP1	NIL	19,312
CPA 10443-P1-0006-CP1	NIL	19,860
CPA 10443-P1-0007-CP1	NIL	13,177
CPA 10443-P1-0008-CP1	NIL	2,269
CPA 10443-P1-0009-CP1	NIL	2,691
<b>Total</b>	<b>NIL</b>	<b>143,301</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>
CNRIT	National Center for Industrial and Technology Research, Madagascar
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	
Miguel A. Cortés Díaz	Technical Reviewer (TR) / Technical Expert (TE)	Yes (3)	Yes (3.1)	N/A	N/A

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

Name	SHORT CV. BACKGROUND INFORMATION
Vivek Kumar Ahirwar	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. He has done Master in Technology (Energy Management) from a premier institute, School of Energy & Environmental Studies, DAVV, Indore (M.P.), India and Bachelor of Engineering (Mechanical Engineering) from Govt. Engineering college, Rewa, RGPV, India
Miguel A. Cortés Díaz	Mr. Miguel Cortés holds a Bachelor's Science Degree on Civil and Environmental Engineering, being specialized on Hydric Resources. He has worked as CDM/VCS/GS and environmental consultant for different industries of multidisciplinary sectors world widely. Mr. Miguel Cortés counts with several years of GHG assessment experience, working and being qualified as Lead Auditor and Technical Reviewer for different DOEs world widely, as well as has been part of Gold Standard expert's committees. Furthermore, he has performed his professional GHG assessment portfolio career worldwide and focusing in Latin America, developing assessments for projects in Argentina, Mexico, Panama, Colombia and Chile, among others.



### Appendix 3. Documents reviewed or referenced

No.	Author	Title	References to the document	Provider
1	Korea Carbon Management Ltd.	Monitoring Report (made publicly available)	Version 1 dated 25/06/2020	CME
2	Korea Carbon Management Ltd.	Monitoring Report Final, version 02 (Final)	Version 2 dated 12/08/2020	CME
3	Korea Carbon Management Ltd.	ER spread sheet corresponding to MR (Final)	Version 02 dated 12/08/2020	CME
3.1	Korea Carbon Management Ltd.	<ul style="list-style-type: none"> <li>ER spread sheet corresponding to MR Version 01</li> </ul>	Version 1 dated 25/06/2020	CME
4	Korea Carbon Management Ltd.	<ul style="list-style-type: none"> <li>Sample Size Calculation Spreadsheet for both the sampling frames:               <ul style="list-style-type: none"> <li>(i) "Sampling Survey_Sampling Frame I (CPA1-4 and 6)_final (Dec 2019)-revised", &amp;</li> <li>(ii) "Sampling Survey_Sampling Frame II (CPA5)_final (Dec 2019)"</li> </ul> </li> </ul>	Version 01, dated 02/12/2019	CME
5	Korea Carbon Management Ltd.	ICS registration database till end date of 3 <sup>rd</sup> MP (i.e. till 31/05/2020)	-	CME
6	Korea Carbon Management Ltd.	<p>Reports of sampling surveys conducted for Madagascar(Survey Data and Report)</p> <p>Certificate of WBT Tests for ICS along with Data Sheet for WBT for the two ICS types –SaoRehitra&amp;Lamasinina.</p>	-	CME
7	Korea Carbon Management Ltd.	<p>Technical Specification of "SoaRehitra"from Manufacturer/supplier certified by CNRIT Lab (including photos of some installed ICSs)</p> <p>Technical Specification of "Lamasinina"from developer certified by CNRIT Lab (including photos of some installed ICSs)</p>	-	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 for both ICS types</li> <li>Certificate of Calibration of Weighing Scale issued by third party (i.e. National Center Industrial and Technological Research) for both the ICS types</li> </ul>	Dated 15/11/2019	CME
9	Korea Carbon Management Ltd.	Water boiling test Forms (11 samples for Lamasinina)	-	CME
10	Korea Carbon	Survey Forms for $N_{y,i,j}$ & $\mu_{y,i,j}$	-	CME

	Management Ltd.	(for both SR & Lamasinina ICS)		
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 Online Field Survey of Registered ICS Users (videos and photos)	-	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,</li> <li>CPA 10443-0003,</li> <li>CPA 10443-0004,</li> <li>CPA 10443-0005,</li> <li>CPA 10443-0006,</li> <li>CPA 10443-0007</li> <li>CPA 10443-0008</li> <li>CPA 10443-0009</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 Version 02 dated 30/08/2019 Version 02 dated 27/08/2019 Version 02.1 dated 11/10/2019 Version 02.1 dated 11/10/2019  Version 02 dated 16/03/2020  Version 02 dated 16/03/2020	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 PoA 10443	Version 02 dated 20/12/2018 <a href="#">Weblink</a>	Others
17	CDM EB	a) CDM Validation and Verification Standard for PoA b) CDM Project Standard for PoA c) CDM Project Cycle Procedure for PoA	Version 02	Others
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="https://getlatlong.net/">https://getlatlong.net/</a>	-	Others

		<a href="http://www.ipcc-nggip.iges.or.jp/">http://www.ipcc-nggip.iges.or.jp/</a>		
20	Korea Carbon Management Ltd.	CDM Monitoring and field Survey Staff training Records and Sessions on Capacity Building etc.	-	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 – WBT Spreadsheet -	Version 4.2.3 Version 4.2.4	Others
23	CDM EB	Standard: Sampling and surveys for CDM project activities and programme of activities	Version 07 as per registered sampling plan (Latest Version 08)	Others
24	CDM EB	Guideline: Sampling and surveys for CDM project activities and programme of activities	Version 04	Others
25	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
26	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
27	KBS Certification Services Pvt. Ltd.	Validation Report for CPA 10443-0004 & CPA 10443-0005 for “Madagascar Improved Cookstove Project by KCM” UNFCCC PoA10443	Version 02 dated 30/08/2019 <a href="#">Weblink</a>	Others
28	KBS Certification Services Pvt. Ltd.	Validation Report for CPA 10443-0006 & CPA 10443-0007 for “Madagascar Improved Cookstove Project by KCM” UNFCCC PoA10443	Version 02 dated 11/10/2019 <a href="#">Weblink</a>	Others
29	CDM EB	Tool 30 “Calculation of fraction of non-renewable biomass”	Version 01	Others
30	Korea Carbon Management Ltd.	f <sub>NRB</sub> value calculation sheet	-	CME
31	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
32	CEDII	Baseline Fuel Consumption Survey Report (Madagascar)	-	Others
33	Korea Carbon Management Ltd.	“Monitoring Forms” as a part of the spot-check mechanism	-	CME
34	KBS Certification	Validation report for CPA 10443-0008 & CPA 10443-0009 for “Madagascar	Version 02 dated 16/03/2020	Others

	Services Pvt. Ltd.	Improved Cookstove Project by KCM" UNFCCC PoA10443		
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## 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				
<b>Documentation provided by project participant</b>				
N/A				
<b>DOE assessment</b>				<b>Date:</b>
N/A				

**Table 2. CL from this verification**

CL ID	01	Section no.	E.2.1	Date :10/08/2020
<b>Description of CL</b>				
<ol style="list-style-type: none"> <li>1. CME is requested to clarify if the distribution of ICS for CPA0005 is completed or not as mentioned in Appendix of MR version 01.</li> <li>2. CME is requested to submit Sample Beneficiary forms for CPA 7, 8 &amp; 9.</li> </ol>				
<b>Project participant response</b>				<b>Date : 14/08/2020</b>
<ol style="list-style-type: none"> <li>1. CME would hereby like to clarify that the CPA 0005 has been completed with distribution. No further distribution will be taken place under the CPA. Please refer to the page 11 of the MR for status of implementation confirmed CPA-wise. Only the distribution under the CPA-0008 has been partially achieved, all other CPAs are completed.</li> <li>2. The sample beneficiary forms for CPA 7, 8 &amp; 9 are submitted to DOE.</li> </ol>				
<b>Documentation provided by project participant</b>				
Sample beneficiary forms – CPA 7, 8 & 9. Revised MR, version 02, dated 12 Aug 2020				
<b>DOE assessment</b>				<b>Date: 20/08/2020</b>
CME has provided revised MR version 02 and sampling beneficiary forms for both the sampling frames. Same has been reviewed and found to be correct, hence CL#1 closed.				

**Table 3. CAR from this verification**

CAR ID	01	Section no.	E.1.1	Date : 10/08/2020
<b>Description of CAR</b>				

1. CME is requested to provide unit of Amount of GHG emission reduction/net anthropogenic GHG removal for both Ex- ante and Achieved values mentioned in title page of MR Version 01.
2. CME is requested to mention any other Methodology/ Methodological tool to which the applied methodology is referred under Section A.1.1 MR as per MR template filling guidance.
3. CME is requested to clarify why is there an inconsistency in the ICS Distribution data between MR (Appendix) and Distribution records.
4. CME is requested to clarify why complete detail of CME (e.g. Fax and Website) as mentioned in PoA PDD is not mentioned in section A.2 of the Monitoring Report version 01.
5. CME is requested to clarify why all regions depicting CPA 0009 are not included in the Zone-wise map in section C.2 of the Monitoring Report version 01.

<b>Project participant response</b>	<b>Date : 14/08/2020</b>
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1. The unit reference has been included under the title page of the MR.
2. The section A.1.1 of the MR has been updated with the specific methodological tools that are referred for the project activity.
3. CME would like to confirm that the data included under the MR for ICS distribution (i.e. Appendix 1) is consistent with the data available in the CPA database. There is no variation in total number of ICS distributed and applicable under the current monitoring period. However, CME would like to highlight that CPA databases include details of each ICS and the monthly distributed total quantities are separately demonstrated as well. Whereas in the Appendix 1, few months data are summed up to arrived at the same value. Therefore, there is a difference in presentation of the ICS distribution status in both the documents; however no inconsistency in total quantity and monthly data. CME has revised the presentation of ICS distribution under the Appendix 1 of the MR for better visibility and reference with the databases.
4. The additional details of CME (i.e. Fax number, website reference etc.) are now included under the section A.2 of the MR.
5. CME would like to confirm that the presentation of zone map is correct for all CPAs. This zone map shows names from list of both Communes & Fokontany, which is as per local municipality maps. These names can be verified from the CPA distribution database.

**Documentation provided by project participant**

Revised MR, version 02, dated 12 Aug 2020  
Distribution Database sheet (updated)

<b>DOE assessment</b>	<b>Date: 20/08/2020</b>
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CME has provided the response to findings along with modifications in MR and ER sheet documents. Same has been reviewed and found to be correct, hence CAR#1 closed.

<b>CAR ID</b>	02	<b>Section no.</b>	E.3.1	<b>Date :10/08/2020</b>
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**Description of CAR**

1. The nomenclature of SaoRehitra ICS is not consistent in the section C.2 of the MR. Please clarify the same?
2. CME is requested to provide information related to Co-benefits imparted as a part of the PoA activities. The section C.1 of the MR mentions that "The implemented CPAs help in achieving following co-benefits, which will contribute in sustainable development in host country as envisaged in the registered POA-DD". However, there are no descriptions of any specific co-benefits. Please provide details/clarify.

<b>Project participant response</b>	<b>Date : 14/08/2020</b>
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1. It was a formatting error. The nomenclature of SaoRehitra ICS has been now made consistent in all paragraphs under the section C.2 of the MR.
2. CME has included the details of co-benefits under the section C.1 of the MR. Also the list of local employment is being submitted to DOE as supporting against quantitative co-benefits of the program.

**Documentation provided by project participant**

Revised MR, version 02, dated 12 Aug 2020  
List of local employment.

<b>DOE assessment</b>	<b>Date: 20/08/2020</b>
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CME has provided the response to findings along with modifications in MR and ER sheet documents. Same has been reviewed and found to be correct, hence CAR#2 closed.

<b>CAR ID</b>	03	<b>Section no.</b>	E.3.3	<b>Date</b>	10/08/2020
<b>Description of CAR</b>					
<ol style="list-style-type: none"> <li>1. CME is requested to correct the word “protable” used on Page-8 of MR version 01.</li> <li>2. CME is requested to provide clarify the current implementation status of CPA 0008 in section C.1 of the MR version 01</li> </ol>					
<b>Project participant response</b>					<b>Date</b> : 14/08/2020
<ol style="list-style-type: none"> <li>1. The typographical errors have been corrected across the MR.</li> <li>2. CME would like to clarify that the ICS distribution under the CPA-0008 has not been completed during the current monitoring period. As on 15<sup>th</sup> May 2020 (which was the last date of distribution for the month May 2020), a total of 12,237 ICS were distributed. The page 11 of the MR (section C.1) mentions the status as “Partially completed” which refers to the incomplete implementation. However, the status quote has been now revised as “Partial distribution achieved” for better presentation of the status of implementation.</li> </ol>					
<b>Documentation provided by project participant</b>					
Revised MR, version 02, dated 12 Aug 2020					
<b>DOE assessment</b>					<b>Date</b> : 20/08/2020
CME has provided the response to findings along with modifications in MR and ER sheet documents. Same has been reviewed and found to be correct, hence CAR#3 closed.					

<b>CAR ID</b>	04	<b>Section no.</b>	E.3.4.2	<b>Date</b>	10/08/2020
<b>Description of CAR</b>					
<ol style="list-style-type: none"> <li>1. CME is requested to clarify inconsistency in reporting of parameter symbol for “Annual Quantity of Woody biomass that would have been used in the absence of the project activity to generate useful thermal energy equivalent to that provided by the project device type i and batch j” in section E.1 of MR version 01 which is not consistent to PoADD and similarly , please clarify the same in ER sheet.</li> <li>2. CME is requested to clarify for parameter “The operating lifetime of the project device” in the “Choice of data or measurement methods and procedures” that why third party test report for Lamasinina ICS is not mentioned in section E.1 of MR version 01.</li> <li>3. CME needs to justify the application of Para 27(a) of the methodology (AMS. II.G, version 09) for ICS efficiency. As per ER sheet and MR, WBT results have been referred for the parameter efficiency which is not consistent with the methodological requirement.</li> <li>4. CME is requested to include information &amp; procedure related to Spot-check mechanism under the section D of the MR.</li> <li>5. CME is requested to provide details of dedicated service team or ground monitoring team, in support of the justification provided under section E.3, page 30 of the MR version 01</li> </ol>					
<b>Project participant response</b>					<b>Date</b> : 14/08/2020
<ol style="list-style-type: none"> <li>1. This was a typographical error, the same is now corrected both in the MR an ER sheet.</li> <li>2. CME has included the reference source of Lamasinina ICS under the section E.1 of the MR to specify the “choice of data....” Related to the operating lifetime of the project device. Kindly refer to the revised MR.</li> <li>3. CME has revised the application of value of efficiency for project device both in the MR and ER sheet. The application of value is now consistent with the para 27 (a) of the methodology, AMS II.G, version 09.</li> <li>4. The practice of spot checks has been included under the section D of the MR. The sample reference copies of spot-check monitoring form are included under Appendix 4 of the MR for further reference. Additional sample copies are submitted to DOE for further reference and verification.</li> <li>5. CME is submitting the details of local team who are responsible for regular monitoring and servicing of the project devices. The organogram and details of the team members are submitted to DOE for further reference and verification.</li> </ol>					
<b>Documentation provided by project participant</b>					
Revised MR, version 02, dated 12 Aug 2020. Revised ER, version 02, dated 12 Aug 2020. Sample copies of spot-check Monitoring Forms. Local team details and organogram.					
<b>DOE assessment</b>					<b>Date</b> : 20/08/2020
CME has provided the response to findings along with modifications in MR and ER sheet documents. Same has been reviewed and found to be correct, hence CAR#4 closed.					

<b>CAR ID</b>	05	<b>Section no.</b>	E.3.4.1	<b>Date :</b> 10/08/2020
<b>Description of CAR</b>				
CME is requested to justify the applicability of B <sub>old</sub> value for all CPAs, under the Section E.1 of the MR.				
<b>Project participant response</b>				<b>Date :</b> 14/08/2020
CME has included a footnote reference (#4) under the section E.1 of the MR which justifies the applicability of the value of B <sub>old</sub> for all the CPAs. Additionally, CME has also submitted the Baseline Survey Report which was conducted by a third party agency and further verified by the host country DNA.				
<b>Documentation provided by project participant</b>				
Revised MR, version 02, dated 12 Aug 2020 Copy of DNA approved Baseline Survey Report.				
<b>DOE assessment</b>				<b>Date:</b> 20/08/2020
CME has provided the response to findings along with modifications in MR and ER sheet documents. Same has been reviewed and found to be correct, hence CAR#5 closed.				

<b>CAR ID</b>	06	<b>Section no.</b>	E.3.6.1	<b>Date :</b> 10/08/2020
<b>Description of CAR</b>				
CME is requested to clarify why Baseline emission information is provided under section F.2 and not under F.1 of the MR version 01.				
<b>Project participant response</b>				<b>Date :</b> 14/08/2020
The information under the section F.1 has been updated and information under the section F.2 has been revised with reference to F.1.				
<b>Documentation provided by project participant</b>				
Revised MR, version 02, dated 12 Aug 2020				
<b>DOE assessment</b>				<b>Date:</b> 20/08/2020
CME has provided the response to findings along with modifications in MR and ER sheet documents. Same has been reviewed and found to be correct, hence 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>Project participant response</b>				<b>Date:</b> N/A
N/A				
<b>Documentation provided by project participant</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		