




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

BASIC INFORMATION			
Title and UNFCCC reference number of the programme of activities (PoA)	Title: Installation of Energy Efficient Cook Stoves in Myanmar UNFCCC reference number: 10008		
Version number(s) of the PoA-DD(s) to which this report applies	Version 10, dated 24/04/2019		
Version number of the verification and certification report	02		
Completion date of the verification and certification report	13/05/2021		
Monitoring period number and duration of this monitoring period	Monitoring period number: 02 Duration of this monitoring period: 01/12/2019 to 31/12/2020 (Including both the dates)		
Number and version number of the monitoring report to which this report applies	Number of the Monitoring Report: 01 Version number of the monitoring report: 02		
Coordinating/managing entity (CME)	Core CarbonX Solutions Pvt. Ltd.		
Host Parties	Host Parties of the PoA	Is this a host Party to a CPA covered in this report? (yes/no)	
	Republic of the Union of the Myanmar	Yes	
Applied methodologies and standardized baselines	Applied methodology: AMS-II.G. (Energy efficiency measures in thermal applications of non-renewable biomass), Version 7.0 Standardized baseline: NA		
Mandatory sectoral scopes	Sectoral Scope: 03- Energy Demand		
Conditional sectoral scopes, if applicable	NA		
Estimated amount of GHG emission reductions or GHG removals for this monitoring period in the included CPAs covered in this report	49,494 tCO ₂ e		
Certified amount of GHG emission reductions or GHG removals for this monitoring period for the included CPAs covered in this report	Amount before 1 January 2013	Amount from 1 January 2013 until 31 December 2020	Amount from 1 January 2021
	0	25,506 tCO ₂ e	0
Name and UNFCCC reference number of the DOE	Name: KBS Certification Services Pvt. Ltd. UNFCCC reference number: E-0051		
Name, position and signature of the approver of the verification and			

certification report

Kaushal Goyal

Managing Director

KBS Certification Services Pvt. Ltd.

SECTION A. Executive summary

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KBS Certification Services Pvt. Ltd. has been commissioned by “Core CarbonX Solutions Pvt. Ltd.” to perform an independent periodic verification of its registered PoA “Installation of energy efficient Cook Stoves in Myanmar” UNFCCC Ref# 10008 for the reported GHG emission reductions for the given monitoring period 01/12/2019 to 31/12/2020 (both dates included). The PoA must undergo independent third-party verification and certification of emission reductions as the basis for issuance of Certified Emission Reductions (CERs). The CPA considered in the verification is:

Ref.	Title
10008-P1-0002-CP1	Installation of energy efficient Cook Stoves in Twante, Yangon region in Myanmar: CPA 002

The objectives of this verification exercise are, by review of objective evidence, to establish that:

- The CPA has been implemented and operated as per the approved revised PoA-DD & CPA-DD and that all physical features (technology, project equipment, and monitoring and metering equipment) of the project are in place;
- Monitoring report and other supporting documents are complete;
- The actual monitoring systems & procedures and monitoring report confirms with the requirements of the approved monitoring plan and the approved monitoring methodology;
- The data is recorded and stored as per the monitoring methodology and approved monitoring plan.

Scope:

The scope of the verification is the independent and objective review and ex post determination of the monitored reductions in GHG emission by the CPAs under the PoA. The verification is based on review of monitoring report, supporting information and

- (a) The approved revised PoA-DD & CPA-DD, including the monitoring plan and the corresponding validation opinion(s);
- (b) Previous verification reports, deviation requests, Post registration changes;
- (c) Monitoring report for the monitoring period under verification including ER calculations sheets and all supporting documents;
- (d) The applied monitoring methodology;
- (e) The applied standardized baseline (if applicable);
- (f) Relevant decisions, clarifications and guidance from the CMP and the CDM Executive Board;
- (g) All information and references relevant to the PoA's resulting in emission reductions

The PoA is assessed against the requirements of the Kyoto Protocol, the CDM Modalities and Procedures and related rules and guidance.

KBS has, based on the recommendations in the latest version of CDM Validation and Verification Standard for programmes of activities, employed a rule-based approach in the verification, focusing on the identification of significant reporting risks and the reliability of project monitoring.

Description of PoA:

The intention of the proposed small-scale Program of Activity (“hereafter SSC-PoA”) involves the installation of energy efficient Improved Cooking Stoves (ICS) in the households/ communities/Small and Medium Enterprises (SMEs) (hereafter “users”) of the Republic of the Union of Myanmar for cooking and water heating purposes. It is also intended to expand the geographical scope of the PoA to the other countries in Asia. Implementation of the proposed activity will reduce the usage of non-renewable biomass i.e. fuel wood for users for cooking and water heating purposes. Thus, the PoA will reduce the GHG emission occurring from the combustion of non-renewable biomass, i.e., fuel wood, thereby also contributing to sustainable development. ICSs that will be disseminated under this PoA are more efficient in transferring heat from the fuel to the pot than the so-called traditional stoves.

The Coordinating and Managing Entity (CME) will target all potential rural and urban populations in all the states of the Republic of the Union of Myanmar. The majority of populations currently use either open fire or “three-stone” method for cooking purpose. Three stone stoves are the cheapest stove to produce, which is

made off three suitable stones or bricks of the same height and mud on which as cooking pot can be balanced over a fire. These open fires are fairly inefficient at converting energy into heat for cooking. Fuel is wasted, as heat is allowed to escape into the open air. Furthermore, these open fires and primitive cook are associated with a number of diseases, the most serious of which are chronic and acute respiratory illnesses, such as bronchitis and pneumonia.

The PoA will promote the dissemination of energy efficient ICS. This will in turn reduce deforestation and degradation of forests in the Republic of the Union of Myanmar through participation of the people in adopting energy efficient stoves. This will also contribute to improvement in quality of lives of the people from the Republic of the Union of Myanmar through reduction of drudgery, time and money spent on fuel wood collection and through improvement of indoor air pollution. Globally, the project will contribute by reducing emission of GHG into the atmosphere.

Methodology:

KBS follows a rule-based verification approach, wherein, as a first step, the contract review is undertaken as per latest version of CDM Accreditation Standard. Subsequently, after the contract is signed, the monitoring report of the PoA is made publicly available at UNFCCC website as per CDM procedures. A desk review of the project documentation is undertaken, which is followed by an onsite visit by the members of verification team in accordance with the latest version of CDM PCP for PoA. The verification protocol is filled by the verification team that is based on standard auditing practices and version 02.0 of CDM VVS for PoA, to capture the assessment of applicable CDM requirements viz., version 02.0 of CDM Project Standard for PoA, revised approved PoA-DD & CPA-DD, applied methodology/ies, applied standardized baseline and/or tools and recent decisions. The verification protocol provides transparent means to record the observations and compliances by the verification team members and the nonconformities, if any. The verification protocol is an internal document, and is available on request. Following are the major milestones for the verification under consideration.

Verification contract	20/02/2021
Publication of MR	02/03/2021
Remote audit verification	22/04/2021- 27/04/2021
Draft Verification Report	06/05/2021
Final Verification Report	13/05/2021

KBS Certification Services Pvt. Ltd. confirms that the monitoring system is in place and the emission reductions are calculated without material misstatements.

Based on the information seen and evaluated we confirm that the implementation of the project has resulted in 25,506 tCO_{2e} (round down) emission reductions during period 01/12/2019 to 31/12/2020 (Including both the days).

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

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)	Involvement in			
						Desk/document review	On-site inspection	Interview(s)	Verification findings
1.	Team Leader	IR	Dey	Deboshmita	Central Office	✓	Remote audit	✓	✓
2.	Technical Expert (TA 3.1)	IR	Kandari	Sanjay	Central Office	✓	Remote audit	✓	✓
3.	Local Expert	EI	Han	Zaw Zaw	Central Office		Remote audit	✓	

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 (TA 3.1)	IR	Chaudhari	Tushar	Central Office
2.	Manager Technical & Certification	IR	Chaudhari	Tushar	Central Office
3.	Authorizer	IR	Goyal	Kaushal	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 can be perceived during registration by CME and during transfer of data from paper to ER sheet by CME for registration of cook stoves.	Medium	Verification team has checked the ER calculation sheet /2.2/ thoroughly to mitigate the risk.	Even though the CME monitoring has been done through sampling and verification team has also done the acceptance sampling to check the data. Verification team has also checked the ER calculation sheet /2.2/ thoroughly to mitigate the risk.
2.	Monitoring parameters are monitored by CME and errors can be perceived during the information transfer from monitoring forms to the emission reduction sheet.	High	There are 06 monitoring parameters which are directly used for the baseline emission. The data monitoring for these monitoring	To mitigate the risk, the complete CME sampling data for all the 6 applicable monitoring parameters as given below has been checked between the CME monitoring forms /14/ and the ER sheet

			parameters is done by CME through Sampling and errors can be perceived during the information transfer from monitoring form to the emission reduction sheet. The complete CME sampling data for all the 6 applicable monitoring parameters has been checked between the CME monitoring forms and the ER sheet.	/2.2/.
3.	Errors can be perceived during the information transfer (Ex-ante parameters) from CPA-DD to the emission reduction sheet.	Medium	There are multiple ex-ante parameters in the Monitoring report which are used for the Baseline GHG emission calculation. Errors can be perceived during the information transfer (Ex-ante parameters) from CPA-DD to the emission reduction sheet.	To mitigate the risk, verification team has checked all the Ex-ante parameters under the ER sheet /2.2/ with the monitoring report and included CPA-DD /03/.

C.2. Consideration of materiality in conducting the verification

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The prescribed thresholds for materiality, as per §308 of “CDM validation and verification standard for programmes of activities” Version 02.0 /07/.

Prescribed range of ERs/annum	500,000+	300,000+ to 500,000	300,000	CDM PoAs comprised only of small-scale CPAs	CDM PoAs comprised only of microscale CPAs
Prescribed Threshold	0.5%	1.0%	2.0%	5.0%	10.0%

The identified/selected materiality threshold for the PoA under current monitoring period is 5% as CPA is small scale.

	MR Version (Draft) /1.1/	MR Version (Final) /1.2/
Emission reductions/monitoring period	23,661 tCO ₂	25,506 tCO ₂
Identified Threshold	5%	5%

There has been change in the emission reduction during the verification process due to the findings raised related to usage rate. Refer to appendix 4 for further details.

The complete dataset for the project activity was checked and it can be confirmed that the values are consistent with their sources. The assessment team confirms that the reported emission reductions are free from material errors, omissions or misstatements.

SECTION D. Means of verification

D.1. Desk/document review

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A desk review is undertaken, involving but not limited to,

- A review of the data and information presented to verify their completeness;
- A review of the monitoring plan and monitoring methodology, paying particular attention to the frequency of measurements, the quality of metering equipment including calibration requirements, and the quality assurance and quality control procedures;
- 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 reviewed is included in the section 'Appendix 3' of this report.

D.2. On-site inspection

As a result of the COVID-19 pandemic, taking into account the CDM Executive Board announcement to relax mandatory site visits till 30 June 2021 /20/, rules of relevant national and local authorities (local to the DOE offices as well as to locality of the site visits), World Health Organization (WHO) recommendations, policies of the DOE and other relevant travel restrictions and guidance (for example, a requirement to self-isolate upon return from specific countries), A DOE may postpone site visits for onsite inspections required by the "CDM validation and verification standard for programme of activities (version 02.0) (VVS-PoA)" /15/.

If the site visits cannot be postponed, a proper justification should be provided by the DOE why the site visits cannot be postponed, including the demonstration of a significant impact of delaying the site visits on the DOE, or project participants or coordinating/ managing entity (e.g. commitment/ timeline as per the validation or verification contract, CER delivery commitment by project participants) reliance on applicable force majeure provisions in the validation or verification contracts, if needed.

For this project activity, CME has contractual commitment for the verification process with KBS and site visit was not undertaken due to COVID-19 travel restrictions. Hence, the DOE has skipped the on-site visit. However as per the CDM EB, the DOE may use other standard auditing techniques for validation or verification as referred to in sections 7.1.3 of the VVS for PoA /15/.

Verification team has used the following alternative means for its assessment and to justify that they are sufficient for the purpose of verification. Along with desk review, audit team has conducted remote audit interview as follows:

- A complete desk review of the MR, revised and approved PoA-DD/14/, Technical specifications/10/, plant records/08/, calibration certificates/06/ etc. as well as all applicable country legal requirement and supportive evidences have been checked by the verification team.
- Verification team has performed Telephonic interview with PP in order to check implementation, project boundary, current situation, evaluation of data management, QA/QC system, monitoring and metering equipment, monitoring procedures, calibration etc.
- Total 16 users were inspected through video conferencing and interviewed in order to assess the baseline practice and usage of cookstoves in the project case for CPA.
- Cross checks between information provided by interviewed personnel (i.e., by checking sources) to ensure that no relevant information has been omitted.
- Cross-check evaluation, for information received from interviews, under the scope of all information and references provided in MR and supporting documents.

Verification team has also checked the site visit requirements mentioned in the VVS for PoA Version 02/15/. The justification as per VVS PoA Version 02 /15/ have been mentioned below:

VVS PoA Version 02/15/ Requirements	Verification team Justification
Para 320 (b)	Verification team has done the follow-up actions by:
(b) On-site inspection taking into account paragraphs	
	1. Telephonic interviews with CME by the team

<p>321–323 below, involving:</p> <p>(i) An assessment of the implementation and operation of the included CPAs as per the included CPA-DDs or any approved revised CPA-DDs;</p> <p>(ii) A review of information flows for generating, aggregating and reporting the monitoring parameters;</p> <p>(iii) Interviews with relevant personnel to determine whether the operational and data collection procedures are implemented in accordance with the registered monitoring plan;</p> <p>(iv) Cross checks between information provided in the monitoring report and data from other sources such as plant logbooks, inventories, purchase records or similar data sources;</p> <p>(v) A check of the monitoring equipment including calibration performance and observations of monitoring practices against the requirements of the included CPA-DDs, the applied methodologies, the applied standardized baselines and the other applied methodological regulatory documents;</p> <p>(vi) A review of calculations and assumptions made in determining the GHG data and GHG emission reductions or net anthropogenic GHG removals;</p> <p>(vii) An identification of quality control and quality assurance procedures in place to prevent, or identify and correct, any errors or omissions in the reported monitoring parameters</p>	<p>leader and Technical expert 3.1.</p> <ol style="list-style-type: none"> 2. Cross checks between information provided by interviewed personnel (i.e. by checking sources) to ensure that no relevant information has been omitted. 3. Used the evidences/photographs submitted by CME.
<p>Para 321 It is mandatory for the DOE to conduct an on-site inspection at verification for the included CPA if:</p> <p>(a) It is the first verification for the DOE with regard to this CPA;</p> <p>(b) More than three years have elapsed since the last on-site inspection conducted for verification for the CPA; or</p> <p>(c) The CPA has achieved more than 300,000 t CO₂ eq of GHG emission reductions or net anthropogenic GHG removals since the last verification when an on-site inspection was conducted.</p>	<p>The verification team has not considered the site visit as mandatory due to the following reasons which are in line with the VVS PoA Version 02 Requirements.</p> <ol style="list-style-type: none"> 1. It is not the first verification for DOE with regard to this CPA. It is the verification of the second monitoring period. Verification team leader had undertaken previous onsite inspection for 1st monitoring period. 2. Also, more than three years have not been elapsed since the last on-site inspection conducted for verification for the CPA. 3. The project has achieved 25,506 tCO₂e which is less than 300,000 tCO₂eq of GHG emission reductions or net anthropogenic GHG removals since the last verification when an on-site inspection was conducted. <p>Hence, for the proposed CPA, it is not mandatory to conduct the physical on site visit, as justified above.</p>

CDM-PoA-VCR-FORM

Details of interviewees, topics covered and additional information presented in the below section "D.3 Interviews".

Duration of on-site inspection:-				
No.	Activity performed on-site	Site location	Date	Team member

D.3. Interviews

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1.	Karthikrao	S.	Core Carbon X	22/04/2021	1) Assessment of the implementation and operation of the CPA as per the validated PoA DD and CPA-DD. 2) Review of information flows for generating, aggregating and reporting of the monitoring parameters. 3) Monitoring Plan. 4) A cross-check between information provided in the MR and data from other sources. 5) Calibration performance, and observations of monitoring practices against the requirements of the CPA-DD and the applied methodology. 6) GHG data and ERs, and 7) QA/QC procedures	Sanjay Kandari (Technical Expert (TA 3.1)), Deboshmita Dey (Team leader)
2	Winklehner	Mr Thomas	ICP			
3	Mohanty	Mr Niroj	Core Carbon X			

Household samples checked during remote audit by DOE:

CPA Ref No./title	Unique serial number of E-FREE cookstoves	Date
Installation of energy efficient Cook Stoves in Twante, Yangon region in Myanmar: CPA 002	16 samples: 1. 5536 2. 14639 3. 9234 4. 17941 5. 6956 6. 7884 7. 11089	22/04/2021-27/04/2021

	8. 10472 9. 13866 10. 5638 11. 4648 12. 9993 13. 16297 14. 4109 15. 6256 16. 5962	
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D.4. Sampling approach

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The single sampling was undertaken by CME for the CPA. The households were selected randomly (by CME) as verified during the remote audit discussion and from submitted Excel sheets /2.2/. Samples were selected by CME as verified from the submitted document /16/. Simple Random sampling was used by CME to select 68 household registered as using E-FREE stoves as checked during the remote audit and also from the document for the selection of samples /14/.

The random sampling was used to select 68 households for the deployed technologies (E-FREE stoves), in which ER is claimed. The process of selecting household to be monitored was witnessed by another staff engaged by CME.

As confirmed from CME, households were selected randomly among all the households registered in the batch of CPAs included in this monitoring report at the time of selection of households to be monitored.

As the monitoring was done for a single CPA, the required confidence level should be 95/10 as per the approved revised PoA-DD /03/.

PP has demonstrated in the ER sheet that how they have calculated sample size with the confidence/precision of 95/10. There were two monitoring parameters under sampling and it was concluded that the related precession is met for both the parameters. Results are as:

Parameter	Expected Results	Precision Level		Sample Size Calculated	Actual Results	Actual Precision Level Achieved	
		Confidence Interval	Margin of Error			Confidence Interval	Margin of Error
N_{xij}	0.85	95%	10%	68	1.00	95%	0.00%
μ_y	0.85	95%	10%	68	0.9002	95%	7.12%

DOE sampling:

As the CME has applied PoA level sampling approach and same samples for all the monitoring parameters, hence the DOE had planned to apply the acceptance sampling in accordance with the paragraph 27-33 of the “Standard: Sampling and surveys for CDM project activities and programme of activities, version 08”. KBS verification team carried out the random sampling from the CME’s sample records and check (using its professional judgment) the acceptability of the data for each record in the CME’s sample records. The DOE has determined acceptance sample size based on the “Table. Sample size and acceptance number based on AQL, UQL, and producer and consumer risks” of standard “Sampling and surveys for CDM project activities and programmes of activities” version 08.0/12/.

During the remote audit verification, a random sampling approach has been used by the verification team to verify the reported values for the monitored parameters as listed in section E.2 of the MR which are determined through sample survey by CME.

For the determination of DOE’s acceptance sample size, verification team has selected the following using its professional judgment:

1. Acceptable quality level (AQL) - 1%
2. Unacceptable Quality Level (UQL) – 20%
3. Producer risk -5%
4. Consumer risk -15%

Verification team has determined acceptance sample size for all the sample survey parameters based on the “Table. Sample size and acceptance number based on AQL, UQL, and producer and consumer risks” of standard “Sampling and surveys for CDM project activities and programmes of activities” version 08.0 /12/. From the above factors, the verification team determined the minimum sample size (n) as 16 and acceptance number (c) as 1. The sample size used to verify the reported values for the monitored parameters which are determined through sample survey by CME. The DOE interviewed the E-FREE stove users and filled the DOE survey form to check the acceptability of the data for each record in the CME’s sample records. Verification team shared the samples with CME during remote audit.

The actual number of sample size where the acceptance survey was done given below:

Parameters	Total Population	CME’s sample size	Acceptance sample size	Acceptance Number	Sampling method used
Monitoring parameters as per section E.2 of the MR	Total households using E-FREE stoves: 20,021	68	16	1	Acceptance Sampling based on random selection of households.

Using acceptance sampling approach, verification team checked the CME’s samples results (reported in the Monitoring forms) along with the following evidences:

1. Remote inspection/interview
2. CME household database
3. Database of all project participating households using the various technologies as per the ER sheet
4. Thermal efficiency of the stoves from stove supplier/determined from qualified laboratory.
5. Shipping details of various technologies used by project participating households

The result of the survey is given below:

Parameters	DOE Sample size	No of CME's record beyond unacceptable level	Accepted
Monitoring parameters as per E.2 of the MR /1.2/	16	0	16

Following the requirement of the paragraph 28 of standard "Sampling and surveys for CDM project activities and programmes of activities" version 08.0, the acceptability of data in the random sample chosen from the CME's sample records was determined. Based on the number of records where there was agreement, it was determined whether the CME's sample records meet the requirements. The acceptability of the data was based on the DOE's professional judgement in line with the paragraph 28 of the Sampling Standard.

All the data records for the monitoring parameters were in line with the CME's sample records and there were no discrepant records found from the CME's records.

Since the number of discrepant records (0) was found less than the acceptance number ($c = 1$), hence the CME's set of records have been accepted based on the acceptance sampling. This is in line with the paragraph 32 of standard "Sampling and surveys for CDM project activities and programmes of activities" version 08.0 and found appropriate.

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

Areas of verification findings	No. of CL	No. of CAR	No. of FAR
General			
Compliance of the monitoring report with the monitoring report form	-	CAR 01	-
Remaining forward action requests from validation and/or previous verifications	-	-	-
CPAs considered for verification and covered in this report	-	-	-
Programme of activities			
Compliance of the programme implementation with the registered PoA-DD	-	-	-
Implementation and operation of the management system	-	-	-
Post-registration changes			
• Corrections	-	-	-
• Inclusion of a monitoring plan	-	-	-
• Permanent changes to the registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines, or other methodological regulatory documents ¹	-	-	-
• Changes to the programme design	-	-	-
• Addition of CPA inclusion template	-	-	-
• Change of coordinating/managing entity	-	-	-
• Changes specific to afforestation and reforestation activities	-	-	-
Component project activities			
Compliance of the CPA implementation with the included CPA design document	-	-	-
Post-registration changes			
• Temporary deviations from registered monitoring plan, applied methodologies, standardized baselines or other methodological regulatory documents	-	-	-
• Corrections	-	-	-

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

• Changes to the start date-of the crediting period	-	-	-
• Inclusion of a monitoring plan	-	-	-
• Permanent changes to the registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines, or other methodological regulatory documents	-	-	-
• Changes to the project design	-	-	-
• Changes specific to afforestation and reforestation activities	-	-	-
Compliance of the registered monitoring plan with applied methodologies and standardized baselines	-	-	-
Compliance of monitoring activities with the registered monitoring plan			
• Data and parameters fixed ex ante or at renewal of crediting period	-	CAR 02	-
• Data and parameters monitored	CL 01, CL 02	-	-
• Implementation of sampling plan	-	-	-
Compliance with the calibration frequency requirements for measuring instruments	-	-	-
Assessment of data and calculation of emission reductions or net removals			
• Calculation of baseline GHG emissions or baseline net GHG removals by sinks	-	-	-
• Calculation of project GHG emissions or actual net GHG removals by sinks	-	-	-
• Calculation of leakage GHG emissions	-	-	-
• Summary of calculation of GHG emission reductions or net GHG removals by sinks	-	-	-
• Comparison of actual GHG emission reductions or net GHG removals by sinks with estimates in included CPA	-	-	-
• Remarks on difference from estimated value in included CPA	-	-	-
Assessment of reported sustainable development co-benefits	-	-	-
Global stakeholder consultation	-	-	-
Others (please specify)	-	-	-
Total	02	02	00

SECTION E. Verification findings

E.1. General

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

Means of verification	Verification team checked the monitoring report with latest version of MR available in the UNFCCC website (i.e., version 4.0) and "Instructions for filling out the monitoring report form" mentioned as attachment to Monitoring report form (version 4.0)/11/.
Findings	CAR-01 has been raised and successfully closed. Refer Appendix-4 of this report for more details.
Conclusion	In accordance with §338 of CDM VVS for programme of activities, Version 02.0 /15/, Verification team confirms that final monitoring report is completed using the latest valid version of the applicable monitoring report form /11/.

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

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Verification team had checked the validation reports of PoA & CPA /03/ and found that total 2 FARs have been raised (=during Validation) for the CPA. All the FARs has been closed during the 1st monitoring period which has been approved by CDM EB.

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

Title and UNFCCC reference number of the CPA included in the PoA as of the end of this monitoring period	Is the CPA considered for this verification? (yes/no)	The date when the CPA was included	Version of the PoA-DD	Confirmation that a request for issuance including the CPA has been published for the previous monitoring period (Y/N)
Title: Installation of energy efficient Cook Stoves in Twante, Yangon region in Myanmar: CPA 002 UNFCCC reference no.: 10008-P1-0002-CP1	Yes	16/07/2019	Version 10	Y

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

Means of verification	<p>During the current monitoring period only two CPA's have been included (whose crediting period fall within this monitoring period) but only one CPA (i.e. CPA 002) has been considered here for verification, which is located in Myanmar.</p> <p>The verification team has checked the conformity of the actual PoA and its operation with the approved revised PoA-DD and determined whether the implementation and operation of the approved revised CDM PoA has been conducted in accordance with the description contained in the approved revised PoA-DD/03/. A total of 20,021 cookstoves have been distributed during the current monitoring period for CPA 002 (part of current verification) as verified from the stove distribution database/19/. This was further reconfirmed through household surveys during the remote audit.</p> <p>The verification team has checked the information in the monitoring report /1.1//1.2/ and compared against the approved revised PoA-DD/03/.</p> <p>During the remote audit inspection, the verification team has checked the PoA implementation, technology applied, project equipment, and monitoring system against the information in the approved revised PoA-DD/03/.</p> <p>Remote audit inspection and Interviews were performed by the verification team to assess the requirements of this section.</p>
Findings	No findings raised.
Conclusion	Verification team concludes that the PoA was implemented and operated as per registered PoA-DD/03/. This confirms the compliance with para 340 of the VVS for PoA version 02.0 /07/.

E.2.2. Implementation and operation of the management system

Means of verification	<p>The verification team determined the implementation and operation management system through the remote audit and interview with the CME and the CPA Implementer (ICP). The verification team checked whether the actual management system implemented in accordance with the management system described in the approved revised PoA-DD/03/ and further verified it from the Project Management Manual /21/.</p> <p>During remote audit, verification team checked the procedures implemented for inclusion of CPA, roles and responsibilities, quality check etc.</p>
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	As discussed during remote audit, the registration of project participating households was done by the CME. A contract was signed with each project participating household and the contract information was then registered in CME database.
	Verification team has checked the distribution records/19/ to cross check for the physical paper contract.
Findings	No findings raised.
Conclusion	The verification team confirms that the implementation and operation of the PoA management system, including the record-keeping system, complies with the registered PoA design document (PoA-DD). This confirms the compliance with para 341 of the VVS for PoA version 02.0 /07/.

E.2.3. Post-registration changes

E.2.3.1. Corrections

>> The corrections have been approved prior to the monitoring period on 06/06/2019. (PRC Ref No. PRC-10008-001 Refer to below link: <https://cdm.unfccc.int/PRCContainer/DB/prcp586320027/view>)

E.2.3.2. Inclusion of a monitoring plan

>>Not Applicable

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

>>

No permanent changes to the monitoring plan described in the PoA-DD /03/ or applied methodology is sought by CME during this monitoring period.

E.2.3.4. Changes to the programme design

>> The changes to programme design have been approved prior to the monitoring period on 06/06/2019. (PRC Ref No. PRC-10008-001 Refer to below link: <https://cdm.unfccc.int/PRCContainer/DB/prcp586320027/view>)

E.2.3.5. Addition of CPA inclusion template

>>

Not Applicable

E.2.3.6. Change of coordination/managing entity

>>

Not Applicable

E.2.3.7. Changes specific to afforestation and reforestation activities

>>

Not Applicable

E.3. Component project activities

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

Means of verification	During the current monitoring period only two CPA's have been included (whose crediting period fall within this monitoring period) but only one CPA (i.e. CPA 002) has been considered here for verification, which is located in Myanmar.
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	<p>Verification team has checked the total no. of the installed stoves by the data base provided by the CME/19/ and cross-checked from Sample check of the beneficiary agreements/22/ and from invoices/shipping document of the stoves/23/.</p> <p>Verification team has, by means of a desk review and remote audit, assessed that all physical features of the proposed component project activity proposed in the validated CPA-DD /03/ are in place and that CME has operated the CPA under verification as per the respective validated CPA-DD/03/.</p> <p>Technologies distributed to households under the CPA considered for monitoring during this monitoring period are in compliance with the PoA-DD /03/ and CPA DD /03/.</p> <p>The monitoring staffs were interviewed during the remote audit and it was confirmed that the training was also provided to the monitoring staff as part of quality control as confirmed from training records /18/.</p> <p>Verification team has checked the number of stoves distributed till the end of monitoring period from the ER sheet /2.2/, the household database provided by CME /19/ and interviews during the remote audit.</p> <p>The verification team has checked the information in the monitoring report and compared against the registered CPA-DD /03/.</p> <p>During the remote audit, the verification team has checked the CPA implementation, technology applied, project equipment and monitoring system against the information in the validated CPA-DD /03/.</p> <p>Verification team has checked the validation reports of PoA & CPA /04/ and found that total 2 FARs were raised during the validation of CPA inclusion. The same have been closed for the CPA under verification for 1st monitoring period.</p> <p>Based on the review of technical description /15/ of technologies implemented under the CPA (under verification in this monitoring period) and remote audit, verification team is able to confirm that the CPA are operational.</p>
Findings	No findings raised.
Conclusion	Thus, the verification team concludes that the CPA was implemented and operated as per validated CPA-DD /03/. The verification team, based on the remote audit and document review, was able to conclude that the CPA have been implemented as per the validated CPA-DD/03/ and that all physical features of the CPA are in place.

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

>>

Not applicable

E.3.2.2. Corrections

>>

Not applicable

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

>>

Not Applicable

E.3.2.4. Inclusion of a monitoring plan

>>

Not applicable as monitoring plan is provided in the CPA-DDs itself.

E.3.2.5. Permanent changes to the registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines, or other methodological regulatory documents

>>

There is no permanent change identified for this monitoring period.

E.3.2.6. Changes to the project design

>>

There is no change in the programme design of the included CPA-DD.

E.3.2.7. Changes specific to afforestation and reforestation activities

>>

Not Applicable

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

Means of verification	The verification team checked compliance of CPA monitoring plan with the applied methodology AMS-II.G. Version 07.0 /05/ including applicable tools.						
	The actual procedures followed for monitoring of parameters are checked against the parameters and procedures provided in the applied methodology.						
	All parameters used for emission reductions calculation have been verified. The discussion regarding each parameter has been elaborated in the further sections of this report.						
	<table><tr><th>Applicability criteria as per applied methodology i.e. AMS-II.G., version 07</th><th>Means of Verification</th></tr><tr><td><p>Requirement as per para 2 of the applied methodology:</p><p>This methodology comprises efficiency improvements in thermal applications of non-renewable biomass. Examples of applicable technologies and measures include the introduction of high efficiency biomass fired project devices (cook stoves or ovens or dryers) to replace the existing devices and/or energy efficiency improvements in existing biomass fired cook stoves or ovens or dryers.</p></td><td><p>Verification team confirms that project activity has disseminated high efficiency E-FREE cook stoves in Myanmar, hence this applicability criterion is met.</p><p>The same is verified during the remote audit, technical specification of the distributed cook stoves/15/, provided efficiency test reports of project cook stoves/16/.</p></td></tr><tr><td><p>Requirement as per para 3 of the applied methodology:</p><p>In the case of cook stoves, the methodology is applicable to introduction of single pot or multi pot portable or in-situ cook stoves with rated efficiency of at least 20 per cent.</p></td><td><p>The E-FREE cook stoves distributed under the project activity are single pot and portable as verified during the remote audit, technical specification of the distributed ICS /15/. The average efficiency of project ICS as per the provided efficiency test reports /16/ is 27.8%, thus complies with the</p></td></tr></table>	Applicability criteria as per applied methodology i.e. AMS-II.G., version 07	Means of Verification	<p>Requirement as per para 2 of the applied methodology:</p> <p>This methodology comprises efficiency improvements in thermal applications of non-renewable biomass. Examples of applicable technologies and measures include the introduction of high efficiency biomass fired project devices (cook stoves or ovens or dryers) to replace the existing devices and/or energy efficiency improvements in existing biomass fired cook stoves or ovens or dryers.</p>	<p>Verification team confirms that project activity has disseminated high efficiency E-FREE cook stoves in Myanmar, hence this applicability criterion is met.</p> <p>The same is verified during the remote audit, technical specification of the distributed cook stoves/15/, provided efficiency test reports of project cook stoves/16/.</p>	<p>Requirement as per para 3 of the applied methodology:</p> <p>In the case of cook stoves, the methodology is applicable to introduction of single pot or multi pot portable or in-situ cook stoves with rated efficiency of at least 20 per cent.</p>	<p>The E-FREE cook stoves distributed under the project activity are single pot and portable as verified during the remote audit, technical specification of the distributed ICS /15/. The average efficiency of project ICS as per the provided efficiency test reports /16/ is 27.8%, thus complies with the</p>
Applicability criteria as per applied methodology i.e. AMS-II.G., version 07	Means of Verification						
<p>Requirement as per para 2 of the applied methodology:</p> <p>This methodology comprises efficiency improvements in thermal applications of non-renewable biomass. Examples of applicable technologies and measures include the introduction of high efficiency biomass fired project devices (cook stoves or ovens or dryers) to replace the existing devices and/or energy efficiency improvements in existing biomass fired cook stoves or ovens or dryers.</p>	<p>Verification team confirms that project activity has disseminated high efficiency E-FREE cook stoves in Myanmar, hence this applicability criterion is met.</p> <p>The same is verified during the remote audit, technical specification of the distributed cook stoves/15/, provided efficiency test reports of project cook stoves/16/.</p>						
<p>Requirement as per para 3 of the applied methodology:</p> <p>In the case of cook stoves, the methodology is applicable to introduction of single pot or multi pot portable or in-situ cook stoves with rated efficiency of at least 20 per cent.</p>	<p>The E-FREE cook stoves distributed under the project activity are single pot and portable as verified during the remote audit, technical specification of the distributed ICS /15/. The average efficiency of project ICS as per the provided efficiency test reports /16/ is 27.8%, thus complies with the</p>						

		requirement of the applied methodology.
	Requirement as per para 4 of the applied methodology: The aggregate energy savings of a single project activity shall not exceed the equivalent of 60 GWh per year or 180 GWh thermal per year in fuel input.	According to the tab "ER Calculation" of the ER sheet /02/, the energy savings per improved cookstoves is 0.005720 GWh _{th} /year. Total stoves installed/operated during the monitoring period are 20,021. It is demonstrated in ER sheet that SSC energy saving threshold breaches, if the number of stoves exceeds 31,376. Hence the project activity is within the small-scale threshold i.e. aggregated thermal energy savings has not exceeded 180 GWh _{th} /year during this monitoring period.
	The monitoring plan is in accordance with the applied methodology. The monitoring has been carried out in accordance with the monitoring plan contained in the registered CPA-DD/03/. All parameters stated in the monitoring plan and the applied methodology has been fulfilled in the current monitoring period. The discussion regarding each parameter has been elaborated in the further sections of this report. The monitoring plan as mentioned in the CPA-DD is in accordance with the applied methodology /05/.	
Findings	No findings raised.	
Conclusion	In the opinion of the verification team the monitoring report complies with the requirement of the applied methodology (AMS-II.G. version 07)/05/ in the context of the CPA. Thus, it conforms to the requirement of §343 of CDM validation and verification standard for programmes of activities, version 02 /07/.	

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

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

Means of verification	The verification team has checked the ex-ante parameters and data stated in Section E.1 of MR and compared with relevant section of the validated CPA-DD that whether all parameters fixed ex-ante for the crediting period have been applied correctly.				
	The Ex-ante parameters are as follows:				
	S. No.	Ex-ante Parameter and unit	Description	Value	Consistent with the respective CPA-DD/03/ & the source mentioned in it
	1	f_{NRB} (Percentage)	Fraction of woody biomass used in the absence of the project activity in year y that can be established as non-renewable biomass.	95	The values were fixed at the time of validation of CPA-DD/03/. The considered values are consistent with the CPA-DD/03/ and the verification team has reviewed the f_{NRB} calculations and found them to be credible. Hence accepted by the verification team.
	2	$B_{old,i,j}$ (tons/year)	Annual quantity of woody biomass used in pre-project scenario	2.15	Default value as per the methodology AMS-II.G. Version 07 is applied which is in accordance with the requirements as verified by the verification team. The values were fixed at the time of validation of PoA-DD and

					CPA-DD/03/ and the verification team has reviewed the $\eta_{old,i,j}$ calculations and found them to be credible. Hence accepted by the verification team.
	3	NCV _{biomass} (TJ/tonne)	Net Calorific Value of the non-renewable biomass that is substituted.	0.015	Default value as per the methodology AMS-II.G. Version 07 is applied which is in accordance with the requirements as verified by the verification team. The values were fixed at the time of validation of PoA-DD and CPA-DD/03/. Hence accepted by the verification team.
	4	η_{old} (Percentage)	Efficiency of the old devices being replaced by project devices.	10	The values were fixed at the time of validation of PoA-DD and CPA-DD/03/ as verified by the verification team.
	5	Leakage (Fraction)	Net to gross adjustment factor of 0.95 to account for leakage.	0.95	Default value in methodology. The values were fixed at the time of validation of PoA-DD and CPA-DD/03/ as verified by the verification team. Hence accepted by the verification team.
Findings	CAR 02 was raised and successfully closed. The resolution of the CAR/CL is detailed in Appendix 4 of this report.				
Conclusion	The values of ex-ante fixed parameters have been verified from the CPA-DD/03/. As per para 347 of CDM VVS for programme of activity version 02.0 /07/, 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	<p>The verification team has determined whether the registered monitoring plan has been properly implemented and followed by the project implementer and CME that the monitoring has been carried out in accordance with the registered monitoring plan; and determined whether all parameters including project emission parameters, baseline emission parameters and leakage parameters used for emission reduction calculation stated in the registered monitoring plan are monitored or used appropriately as per the registered CPA-DD.</p> <p>During the verification all monitoring parameters listed in Section E.2 of MR were compared with monitoring parameters and the monitoring plan of the registered CPA-DD and have been verified with regard to the:</p> <ul style="list-style-type: none"> (i) appropriateness of the applied measurement / determination method, (ii) the correctness of the values applied for ER calculation, (iii) the accuracy, and applied QA/QC measures. <p>Verification team has checked the monitoring parameters value indicated in the emission reduction spreadsheet on sample basis as per the sampling defined in the section D.4 of this report, with remote audit.</p>				
	Ex-post parameters		Verification opinion of the verification team		
	Number of project devices of type I and batch j operating during the year y		Verification team has verified the monitoring parameter through sample		

	$(N_{y,l,j})$ 20,021	check documents/14/, remote audit interviews and also from the details given under the ER sheet /02/ and found consistent. The sampling approach and the results of the sampling by verification team are explained in the section D.4 of this report.
	Number of days of utilization of the project device l and batch j during the year y ($\mu_{y,l,j}$) 397 days for 4,973 E-FREE Stove. 397 days for 4,966 E-FREE Stove. 397 days for 4,973 E-FREE Stove. 372 days for 5,109 E-FREE Stove.	Verification team has verified the monitoring parameter through sample check of the stove distribution database /19/, remote audit interview and also from the details given under the ER sheet /02/ and found consistent. The sampling approach and the results of the sampling by verification team are explained in the section D.4 of this report.
	Efficiency of the project design l and batch j implemented as part of the project activity ($\eta_{new,l,j}$) 0.278	Verification team has checked the monitored data through remote audit interview, all the Efficiency test reports for ICS /16/ and the ER sheet /02/. The data was found consistent. Efficiency is fixed ex-ante however the same was again reconfirmed and based on local and sectoral expertise; verification team found the test reports in compliance with WBT protocols. The monitoring plan has a provision of linear decrease of efficiency as per methodology. However this is first year of operation thus no decrease considered for this monitoring period.
	The operating lifetime of the project activity (Life span) 3	Verification team has checked the monitored data through technical documents for the lifetime of the E-FREE cook stove/15/. The data was found consistent.
	Date of commission of batch j 1 st batch- 31/08/2019 - 4,973 2 nd batch- 02/10/2019 - 4,966 3 rd batch- 16/11/2019 – 4,973 4 th batch- 25/12/2019 – 5,109	The commissioning date of each batch of ICS is mentioned in the commissioning certificates/22/ and from sample ICS remote audit interview. Verification team has verified the monitoring parameter through sample check of the beneficiary agreements/commissioning certificates (mention the date of use of ICS) /22/, remote audit interview and also from the details given under the ER sheet /02/ and found consistent.
	Date of commissioning of project device i	The commissioning date of each batch of ICS is mentioned in the commissioning certificates/22/ and from sample ICS remote audit interview. Verification team has verified the monitoring parameter through sample check of the beneficiary agreements/commissioning certificates (mention the date of use of ICS) /22/, remote audit interview and also from the details given under the ER sheet /02/ and found consistent.

Findings	CL 01 and CL 02 were raised and successfully closed. The resolution of the CAR/CL is detailed in Appendix 4 of this report.
Conclusion	Corresponding to the §346 of VVS for PoA Version 02.0/07/, the team confirm that the monitoring has been carried out in accordance with the validated CPA-DD/03/. The monitoring system is in compliance with the information flow for the parameters as mentioned in monitoring plan in validated CPA-DD/03/. The monitored data for the parameters has been verified by checking the procedure for information flow and found to be complete and consistent.

E.3.4.3. Implementation of sampling plan

Means of verification	<p>The single sampling was undertaken by CME for the CPA. The households were selected randomly (by CME) as verified during the remote audit discussion and from submitted Excel sheets /25/. Samples were selected by CME as verified from the submitted document /14/. Simple Random sampling was used by CME to select 68 household registered as using E-FREE stoves as checked during the remote audit and also from the document for the selection of samples /14/.</p> <p>The random sampling was used to select 68 households for the deployed technologies (E-FREE stoves), in which ER is claimed. The process of selecting household to be monitored was witnessed by another staff engaged by CME.</p> <p>As confirmed from CME, households were selected randomly among all the households registered in the batches of the CPA included in this monitoring report at the time of selection of households to be monitored.</p> <p>As the monitoring was done for a single CPA, the required confidence level was taken as 95/10 as per the approved revised PoA-DD /03/. CME double checked all the monitoring forms and all the registered monitoring data for additional quality purposes.</p> <p>Verification team has conducted acceptance sampling to verify the parameter monitored through sampling. The verification team calculated the minimum sample size (n) as 16 and acceptance number (c) as 1 (considering AQL - 1%, UQL - 20%, producer risk – 5% & consumer risk – 15%). Verification team has done survey randomly in 16 number of households (selected from the CME's sample population) and verified the CME's survey data.</p>
Findings	No findings raised.
Conclusion	Verification team confirms that the sampling approach applied by the CME is in accordance with the registered PoA-DD and the CPA-DD including the Guidelines: Sampling and surveys for CDM project activities and programmes of activities, Version 04.0 /13/ and Standard: Standard for sampling and surveys for CDM project activities and Programme of Activities, version 08.0 /12/.

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

Means of verification	Not applicable as no monitoring equipment were involved. For the monitoring parameter $\eta_{new,i,j}$ the efficiency test was carried out by third party i.e. Institute of Minerals & Materials Technology (IMMT). Efficiency is ex-ante parameter therefore need not to be monitored during verification.
Findings	Not Applicable
Conclusion	Not Applicable

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

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

Means of verification	Verification team confirm that the calculation, applied formulae and the method for calculation of baseline emissions are in accordance with the registered PoA-DD /03/ and are in line with the requirements of the applied methodology (AMS-II.G. ver. 7 /05/). The formulae and the methods referred in the MR /01/ and the emission reduction calculation spread sheet /02/ for estimation of emission reduction complies with the corresponding formulae and methods in the registered PoA-DD /03/.
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As per the registered PoA-DD /03/ and CPA-DD/03/, The calculation of emission reductions is based on the number of individuals served instead of number of project devices.

The emission reduction is calculated using the formula:

$$ER_{y,i} = B_{y,savings,i} \times N_{y,i,j} \times \mu_{y,i,j}/365 \times f_{NRB,y} \times NCV_{biomass} \times EF_{projected_fossilfuel} - LE_y$$

Where:

$B_{y,savings,i}$ = Quantity of woody biomass that is saved in tonnes per person in year y

$N_{y,i,j}$ = Number of individuals served in year y

$\mu_{y,i,j}$ = Adjustment to account for any continued use of pre-project device during the year y when applying equations 6 and 8 of the methodology (fraction). Use 1.0 in other cases

$f_{NRB,y}$ = Fraction of woody biomass saved by the project activity in year y.

$NCV_{biomass}$ = Net calorific value of the non-renewable woody biomass that is substituted.

$EF_{projected_fossilfuel}$ = Emission factor for the fossil fuels projected to be used for substitution of non-renewable woody biomass by similar consumers.

LE_y = Leakage emissions in the year y

For $B_{y,savings,i}$, PP has used equation 6 of option 3 of the applied methodology AMS-II.G. Version 7 /05/ which is in compliance with the registered PoA-DD /03/ and CPA-DD/03/.

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

Where:

$B_{old,i,j}$ = Annual quantity of woody biomass that would have been used per person in the school/institution in the absence of the project activity to generate useful thermal energy equivalent to that provided by the project devices

$\eta_{old,i,j}$ = Efficiency of the baseline system/s being replaced by project devices of type i.

$\eta_{new,i,j}$ = Efficiency of the system being deployed as part do the project activity (fraction), as determined using the efficiency test report.

All the ex-ante parameters (1. $B_{old,i,j}$, 2. $\eta_{old,i,j}$, 3. $f_{NRB,y}$, 4. $NCV_{biomass}$, 5. $EF_{projected_fossilfuel}$, 6. LE_y) have been justified in the section E.3.4.1 of this report. Verification team confirms that all the ex-ante parameters used in the ER sheet /02/ are in accordance with the registered PoA-DD /03/ and also the applied methodology /05/.

Also the ex-post parameters (1. $\eta_{new,i,j}$, 2. $N_{y,i}$, 3. μ_y) have been justified in the section E.3.4.2 of this report. Verification team confirms that all ex-post parameters have been monitored in accordance with the registered PoA-DD /03/ and also the applied methodology /05/.

The calculation of the emission reductions /02/ is based on an individual household based on the number of individuals served which is in compliance with the registered PoA-DD /03/.

The steps taken and the equations and parameters applied in the ER sheet /02/ to calculate emission reductions comply with the requirements of the registered PoA-DD /03/ and the selected methodology /05/. The emission reduction calculation is completely traceable and verified by reviewing the ER spread sheet /02/ submitted by the CME.

Hence baseline emission for this monitoring period is 25,506 tCO_{2e} (Rounded down).

	<p><u>Determine total CPA emission reduction:</u></p> <p>CME has submitted the calculation in the excel sheet/02/. The baseline calculation in the excel sheet is checked whether the calculation is in accordance with the formula given in the validated CPA-DD/03/ and the selected methodology/05/ and found OK.</p>
Findings	No findings raised.
Conclusion	<p>The verification team confirms the following:</p> <ul style="list-style-type: none"> • The calculations of baseline GHG emissions have been carried out in accordance with the equations and methods described in the registered monitoring plan and applied methodology. • Any assumptions used in emission or removal calculations have been justified. • Appropriate emission factor and other reference values have been correctly applied. It can be confirmed that the baseline calculation is overall correct. • The ER calculation sheet provided is clear, transparent and the calculations provided in the sheet are reproducible. • Hence, the baseline emission in the monitoring report for the monitoring period (i.e., 25,506 tCO₂e) is verified to be correct.

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

Means of verification	There is no project emissions and hence not applicable.
Findings	No findings raised.
Conclusion	There is no project emissions and hence not applicable.

E.3.6.3. Calculation of leakage GHG emissions

Means of verification	There is no leakage emissions and hence not applicable. However, potential leakage is accounted for by multiplying with net gross adjustment factor which is one of the alternatives in the registered PoA-DD/03/ and hence accepted to the Verification team.
Findings	No findings raised.
Conclusion	Verification team concludes that there is no leakage emission for this monitoring period.

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

Means of verification	<p>The verification team has checked whether calculations of GHG emission reduction have been carried out in accordance with the formulae and methods described in the registered monitoring plan.</p> <p>Section F.4 of MR demonstrate the summary of GHG emission reductions for the monitoring period and calculated according to the applied methodology as follows: $ER_y = BE_y - PE_y - LE_y$</p> <p>The ER calculation sheet and monitoring report is verified to check the calculation.</p>
Findings	No findings raised.
Conclusion	<p>The verification team confirms the following:</p> <ul style="list-style-type: none"> • The emission reduction value reported (i.e., 25,506 tCO₂e) is verified to be correct. • The summary table in the MR has been filled correctly and the values are in line with the related emissions reduction spreadsheet. <p>Since the complete monitoring period falls after 31/12/2012, the complete emission reductions are correctly reported under the respective column in the MR.</p>

Title and UNFCCC reference number of the CPA	Baseline emissions or baseline net GHG removals by sinks (tCO ₂ e)	Project emissions or actual net GHG removals by sinks (tCO ₂ e)	Leakage (tCO ₂ e)	GHG emission reductions or net GHG removals by sinks (tCO ₂ e)		
				Amount achieved before 1 January 2013	Amount achieved from 1 January 2013	Amount achieved in the entire monitoring period
Title: Installation of energy efficient Cook Stoves in Twante, Yangon region in Myanmar: CPA 002 UNFCCC reference no.: 10008-P1-0002-CP1	25,506	0	0	0	25,506	25,506
Total	25,506	0	0	0	25,506	25,506

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

Means of verification	<p>The verification team has checked whether the MR includes a comparison of actual values of the monitoring period with the estimations in the validated CPA-DD/03/. Section F.5 of the MR includes a comparison of the calculated actual emission reductions with the ex-ante calculated values in the registered CPA-DD /03/.</p> <p>The actual achieved emission reduction is less than estimated emission reduction mentioned in the CPA-DD/03/.</p>
Findings	No findings raised.
Conclusion	<p>The estimated emission reduction as per CPA-DD and the actual emission reduction achieved for the monitoring period are correctly reported in the section F.5 of MR.</p> <p>The actual achieved emission reduction for CPA is less than the CPA-DD estimation. Hence no justification is required.</p>

Title and UNFCCC reference number of the CPA	Actual values achieved by the CPAs during this monitoring period	Value estimated in ex ante calculation in the included CPA-DD(s)
Title: Installation of energy efficient Cook Stoves in Twante, Yangon region in Myanmar: CPA 002 UNFCCC reference no.: 10008-P1-0002-CP1	25,506 tCO ₂ e	49,494 tCO ₂ e
Total	25,506 tCO₂e	49,494 tCO₂e

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

Means of verification	The actual achieved emission reduction for CPA during this monitoring period is less than the CPA-DD estimation/03/. There is a decrease of 48.47 % in the actual emission reduction as against stated in the registered CPA-DD due to CPA not been fully implemented yet.
Findings	No findings raised.
Conclusion	The actual achieved emission reduction for CPA during this monitoring period is less than the CPA-DD estimation.

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

Means of verification	Not applicable to the proposed programme of activity.
Findings	Not applicable to the proposed programme of activity.
Conclusion	Not applicable to the proposed programme of activity.

E.3.8. Global stakeholder consultation

Means of verification	Not applicable for 2 nd monitoring period.
Findings	Not applicable for 2 nd monitoring period.
Conclusion	Not applicable for 2 nd monitoring period.

SECTION F. Internal quality control

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The draft verification report prepared by team leader is reviewed by an independent technical reviewer (having competence of relevant technical area himself/herself or through an independent technical area expert) to confirm the internal procedures established by KBS are duly followed and the verification report/opinion is reached in an objective manner and complies with the applicable CDM requirements.

The independent technical reviewer may approve or reject the draft verification report. The findings may be identified even at this stage, which needs to be satisfactorily resolved, before the request for issuance is submitted to UNFCCC. The final decision is taken by the Manager Technical and Certification. The technical reviewer and Manager (Technical & Certification) can be same person.

The final decision is authorized by Managing Director, KBS once the report is approved by the Manager (Technical & Certification).

SECTION G. Verification opinion

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The verification team confirms that the evidence is of sufficient quantity, appropriate quality and reliable. The reported values, notation, units and sources in the monitoring report for all the monitoring parameters have been cross checked with the emission reduction sheet and monitoring report. During the course of verification and remote audit, the data submitted by PP was cross verified with the values mentioned in the emission reduction sheet/2.2/ and monitoring report/1.2/. The procedure for data monitoring, recording, transfer and compilation was also verified and found in compliance with the monitoring plan as mentioned in the registered PoA-DD & included CPA-DD.

It is confirmed by the assessment team that the reported emission reductions have been conservatively calculated. A list of referred documents for verification is also included in Appendix 3 of this report.

Based on the information seen and evaluated we confirm that the implementation of the PoA has resulted in 25,506 tCO₂e emission reductions during monitoring period 01/12/2019 to 31/12/2020 (first and last days are included).

SECTION H. Certification statement

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KBS Certification Services Pvt. Ltd. has been contracted by 'Core CarbonX Solutions Pvt. Ltd.' to undertake independent verification and certification for the greenhouse gas (GHG) emission reductions reported from the CDM PoA "Installation of energy efficient Cook Stoves in Myanmar" and UNFCCC Reference Number 10008 for the monitoring period 01/12/2019 to 31/12/2020 (including both dates) in the Monitoring Report Version 01 (first version) dated 04/02/2021.

The verification is based on the approved revised PoA-DD /03/ & approved CPA-DD /03/ and the monitoring report for this PoA. Our verification approach was based on the requirements as defined under the Kyoto Protocol, as well as those defined by the CDM Executive Board.

The management of the 'Core CarbonX Solutions Pvt. Ltd.' is the coordinating/Managing Entity and it is responsible for inclusion of CPAs under this PoA. 'Core CarbonX Solutions Pvt. Ltd.' is also responsible for the preparation of the GHG emissions data and the reported GHG emissions reductions on the basis set out within the PoA. The "International Carbon Portfolio Ltd (ICP)" is the CPA Implementer and responsible for the purchase / distribution / maintenance of the stoves. The calculation and determination of GHG emission reductions from the PoA is the responsibility of the management of the 'Core CarbonX Solutions Pvt. Ltd.'. The development and maintenance of records and reporting procedures are in accordance with the Monitoring Report Version 02 dated 06/05/2021.

It is our responsibility to express an independent GHG verification opinion on the GHG emissions and on the calculation of GHG emission reductions from the PoA for the monitoring period 01/12/2019 to 31/12/2020 (including both dates) based on the reported emission reductions in the Final Monitoring Report Version 02 dated 06/05/2021 for the same period.

Based on an understanding of the risks associated with reporting GHG emissions data and the controls in place to mitigate these, KBS planned and performed our work to obtain the information and explanations that we considered necessary to provide sufficient evidence for us to give reasonable assurance that this reported amount of GHG emission reductions for the period is fairly stated. KBS confirms the following;

Reporting period: 01/12/2019 to 31/12/2020 (including both dates)

Verified emission in the above reporting period:

Baseline emissions (BE) (tCO ₂ e)	Project emissions (PE) (tCO ₂ e)	Leakage emissions (LE) (tCO ₂ e)	Verified emission reductions (ERs) (tCO ₂ e)
25,506	0	0	25,506

Appendix 1. Abbreviations

Abbreviations	Full texts
AQL	Acceptable quality level
BE	Baseline Emissions
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CER	Certified Emission Reduction
CL	Clarification request
CME	Coordinating/managing entity
CO ₂	Carbon dioxide
COP	Conference of Parties
CPA	Component Project Activity
CPA DD	Component Project Activity Design Document
DOE	Designated Operational Entity
DNA	Designated National Authority
ERs	Emission Reductions
FAR	Forward Action Request
GHG	Greenhouse gas(es)
ICS	Improved cook stoves
ICP	International Carbon Portfolio Ltd
IMMT	Institute of Minerals & Materials Technology
IPCC	Intergovernmental Panel on Climate Change
KBS	KBS Certification Services Pvt. Ltd.
LDC	Least Developed Country
MCS	Myanmar Ceramic Society
MOP	Meeting of Parties
MP	Monitoring Plan
MR	Monitoring Report
NCV	Net Calorific value
PE	Project Emissions
PCP	Project cycle procedure
PoA	Programme of Activity
PoA-DD	Programme of Activity Design Document
PRC	Post Registration Changes
QA/QC	Quality Assurance/Quality Control
SME	Small and Medium Enterprises
SSC-PoA	Small scale Programme of Activity
TA	Technical Area
T&C	Technical & Certification
UNFCCC	United Nations Framework Convention on Climate Change
UQL	Unacceptable quality level
VVS	Validation & Verification Standard

Appendix 2. Competence of team members and technical reviewers

Personnel Name:		Sanjay Kandari	
Qualified to work as:			
Team Leader	<input checked="" type="checkbox"/>	Technical Expert	<input checked="" type="checkbox"/>
Validator/Verifier	<input checked="" type="checkbox"/>	Financial Expert	<input checked="" type="checkbox"/>

Technical Reviewer	<input checked="" type="checkbox"/>	Local Expert (India)	<input checked="" type="checkbox"/>
Area(s) of Technical Expertise			
Sectoral Scope	Technical Area		
Energy Industries (renewable/non-renewable sources)	TA 1.1: Thermal energy generation from fossil fuels and biomass including thermal electricity from solar		
Energy industries (renewable/non-renewable sources)	TA 1.2: Energy generation from renewable energy sources		
Energy demand	TA 3.1. Energy Demand		
Waste Handling and Disposal	TA 13.1 Waste Handling and Disposal TA 13.2 Manure		
Approved by (Manager C & T)	Akhilesh Joshi		
Approval date:	11/12/2015		

Personnel Name:	Ms. Deboshmita Dey		
Qualified to work as:			
Team Leader	<input checked="" type="checkbox"/>	Technical Expert	<input checked="" type="checkbox"/>
Validator/Verifier	<input checked="" type="checkbox"/>	Financial Expert	<input type="checkbox"/>
Technical Reviewer	<input type="checkbox"/>	Local Expert	<input type="checkbox"/>
Area(s) of Technical Expertise			
Sectoral Scope	Technical Area		
Energy industries (renewable/non-renewable sources)	TA 1.2: Energy generation from renewable energy sources		
Waste Handling and Disposal	TA 13.1 Waste Handling and Disposal		
Approved by (Manager C & T)	Sanjay Kandari		
Approval date:	14/01/2021		

Personnel Name:	Mr. Zaw Zaw Han		
Qualified to work as:			
Team Leader	<input type="checkbox"/>	Technical Expert	<input type="checkbox"/>
Validator/Verifier	<input type="checkbox"/>	Financial Expert	<input type="checkbox"/>
Technical Reviewer	<input type="checkbox"/>	Local Expert (Myanmar)	<input checked="" type="checkbox"/>
Area(s) of Technical Expertise			
Sectoral Scope	Technical Area		
Not applicable	Not applicable		
Approved by (Manager C & T)	Sanjay Kandari		
Approval date:	03/06/2017		

Personnel Name:	Tushar Chaudhari		
Qualified to work as:			
Team Leader	<input checked="" type="checkbox"/>	Technical Expert	<input checked="" type="checkbox"/>
Validator/Verifier	<input checked="" type="checkbox"/>	Financial Expert	<input checked="" type="checkbox"/>
Technical Reviewer	<input checked="" type="checkbox"/>	Local Expert (India)	<input checked="" type="checkbox"/>
Area(s) of Technical Expertise			
Sectoral Scope	Technical Area		
Energy Industries (renewable/non-renewable)	TA 1.1: Thermal energy generation from fossil fuels and biomass including thermal electricity from solar		

sources)	
Energy industries (renewable/non-renewable sources)	TA 1.2: Energy generation from renewable energy sources
Energy demand	TA 3.1. Energy Demand
Waste Handling and Disposal	TA 13.1 Waste Handling and Disposal
Approved by	Manager Competency & Training
Approval date:	02/09/2020

Appendix 3. Documents reviewed or referenced

No	Author	Title	References to the document	Provider
1.1	CME	Monitoring Report	Version 01, dated 04/02/2021	CME
1.2	CME	Final Monitoring Report	Version 02, dated 06/05/2021	CME
2.1	CME	ER calculation sheet corresponding to MR version 01	Corresponding to MR version 01	CME
2.2	CME	Final ER calculation sheet corresponding to Final MR	Corresponding to MR version 02	CME
3.	CME	Revised approved PoA-DD	Version 10, dated 24/04/2019	Publicly available
	CME	Specific CPA-DD of CPA 0002	Version 02.1, dated 01/07/2019	
4.	Shenzhen CTI	PoA validation report	dated 12/03/2017	Publicly available
	Applus	Validation reports for Specific CPA-DD of CPA 0002	Dated 15/07/2019	
5.	UNFCCC	AMS-II.G., Energy efficiency measures in thermal applications of non-renewable biomass	Version 07	Publicly available
6.	UNFCCC	Kyoto Protocol (1997)	Web link	Publicly available
7.	UNFCCC	CDM validation and verification standard for programmes of activities	Version 02.0	Publicly available
8.	UNFCCC	CDM project standard for programmes of activities	Version 02.0	Publicly available
9.	UNFCCC	Glossary “CDM terms”	Version 10	Publicly available
10.	UNFCCC	Guidelines for Application of materiality in verifications	version 2.0	Publicly available
11.	UNFCCC	MR filling guideline “CDM-PoA-MR-FORM Monitoring report form for CDM programme of activities”	Version 04.0	Publicly available
12.	UNFCCC	Standard “Sampling and surveys for CDM project activities and programme of activities”	Version 08.0	Publicly available
13.	UNFCCC	Guidelines for sampling and surveys for CDM project activities and programme of activities	Version 04.0	Publicly available
14.	CME	Sampling results along with monitoring forms/ Household survey reports, Feedback forms/Sampling survey forms	-	CME
15.	MCS	Technical documents for the lifetime and	-	CME

		efficiency of the E-FREE cook stove		
16.	IMMT	TEST reports for efficiency	-	CME
17.	CME	Supportive stating avoidance of double counting.	-	CME
18.	CME	Training records for kitchen/monitoring team	-	CME
19.	CME	Stove distribution database	-	CME
20.	CME	QA/QC Manual and maintenance manual	-	CME
21.	CME	Monitoring manual, Project Management Manual	-	CME
22.	CME	Commissioning certificates of each batch of cook stoves distributed/Sample beneficiary agreements	-	CME
23.	CPA Implementer	Invoices/shipping document of the stoves	-	CME
24.	CPA Implementer	Installation database	-	CME
25.	CME	Sampling analysis sheet	-	CME
26.	CME	Undertaking from the CME regarding non-diversion of ICS	Dated 08/02/2020	CME

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

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

All FARs during 1st verification was closed.

FAR ID	Section no.	Date:
Description of FAR		
CME response		Date:
Documentation provided by CME		
DOE assessment		Date:

Table 2. CL from this Verification

CL ID	Section no.	Date:
01	E.3.4.2	28/04/2021
Description of CL		
Following are the documents required for the further validation process:		
<ol style="list-style-type: none"> 1. Sampling results along with monitoring forms for current MP 2. ER Calculation sheet 3. Stove distribution database/installation database of fourth batch installed 4. Internal records for date of commissioning of fourth batch installed 5. Usage survey results of fourth batch installed 6. Commissioning certificates of 4th batch of cookstoves 7. Records of sales of fourth batch installed 		
CME response		Date: 28/04/2021

1. Monitoring Survey was conducted by telephonic survey due to COVID-19 restrictions and the results are attached as Annexure -1.
2. ER Calculation Sheet attached as Annexure-2
3. Fourth Lot Distribution data attached as Annexure -3.
4. Beneficiary agreement with the end user to support the date of commissioning of 4th lot attached as Annexure-4.
5. Attached as Annexure -1.
6. Under the 4th Lot 5,109 number of cookstoves distributed from 01/12/2019 to 24/12/2019 and date of commissioning is considered from the next day of last day distribution i.e 25/12/2019. Beneficiary agreement with the end user to support the date of commissioning of 4th lot attached as Annexure-4
7. Cookstove supply confirmation from the Myanmar Ceramic Society to confirm the sale of cookstoves to the investor attached as Annexure-5.

Documentation provided by CME

Survey sheet, ER calculation sheet, CPA database, beneficiary agreement, Cookstove supply confirmation from the supplier

DOE assessment**Date:** 06/05/2021

1. The survey excel sheet has been provided by CME and was found to be acceptable. Hence, the finding is closed.
2. The ER calculation sheet has been now provided. However, the achieved ERs mentioned in the ER sheet (25,506) is not consistent with the MR cover page (23,661). Hence, the finding is open.
3. The CPA database has been provided by CME and was found to be acceptable. As mentioned by CME, the no. of cookstoves distributed under 4th batch is 5,109. The same was cross-checked with the database and was found to be consistent. Hence, the finding is closed.
4. The sample beneficiary agreements of users have been provided and was found to be acceptable. Hence, the finding is closed.
5. The excel sheet on usage results have been provided by CME and was found to be acceptable. Hence, the finding is closed.
6. As checked by the verification team from the CPA database and the beneficiary agreements submitted, the cookstoves distributed during the 4th batch is in between 01/12/2019 to 24/12/2019. Hence, the justification for start date is found to be acceptable. The finding is closed.
7. The cookstove supply confirmation indicating the confirmation of payment received has been provided and was found to be acceptable. Hence, the finding is closed.

CME response**Date:** 06/05/2021

The ERs 25,506 is corrected as per the ER sheet in the revised MR.

Documentation provided by CME

Revised MR

DOE assessment**Date:** 06/05/2021

The ERs has been revised in the MR. Hence, the finding is closed.

CL ID	02	Section no.	E.3.4.2	Date: 28/04/2021
Description of CL				
During the survey conducted with the users by the assessment team, it was found that few beneficiaries are still using the baseline cookstove. CME shall clarify how this has been taken into account.				
CME response				Date: 28/04/2021

The beneficiaries who are still using baseline cookstoves are assessed based on the cookstove usage rate of improved cookstoves and the results of the cookstove usage rate of surveyed beneficiaries were presented in the monitoring results.

Documentation provided by CME	
Monitoring Survey Results attached as Annexure -1.	
DOE assessment	Date: 06/05/2021
The justification provided by CME was found to be acceptable. The usage rate has been calculated appropriately as per the monitoring plan. However, it's application on the monitoring results could not be traced in the ER sheet and MR. Hence, the finding is open.	
CME response	Date: 06/05/2021
The usage rate of 0.9002 is applied in the ER calculation sheet, same can be verified from "ER Calculation" sheet cell number E15, F15, G15 and H15 and same can be found in the section F.2. of MR.	
Documentation provided by CME	
-	
DOE assessment	Date: 06/05/2021
The verification team was able to trace the calculation in the ER sheet now. Hence, the finding is closed.	

Table 3. CAR from this verification

CAR ID	01	Section no.	E.1.1	Date: 28/04/2021
Description of CAR				
<ol style="list-style-type: none"> 1. CME shall mention correct representation of the achieved ERs (add comma). For example: mention 49,494 instead of 49494. 2. CME shall use the latest version of the MR Form i.e., Version 04 available at the UNFCCC website. 				
CME response				Date: 28/04/2021
<ol style="list-style-type: none"> 1. The representation of the CERs are corrected in the revised MR. 2. MR is updated as per the latest version i.e Version 04. 				
Documentation provided by CME				
Revised MR.				
DOE assessment				Date: 06/05/2021
<ol style="list-style-type: none"> 1. CME has now mentioned correct representation of the ERs in the revised MR throughout. Hence, the finding is closed. 2. CME has used the latest version of the MR template and was found to be consistent. Hence, the finding is closed. 				

CAR ID	02	Section no.	E.3.4.1	Date: 28/04/2021
Description of CAR				
Verification team has found that all the required ex-ante parameters (As per the registered PoA-DD) like EF _{projected_fossilfuel} , AF and Leakage _{charcoal} have not been reported in the Section E.1 of the web-hosted MR. CME need to include all the parameters (ex-ante) in the MR in line with the registered PoA-DD.				
CME response				Date: 28/04/2021
As per the guidelines "CDM-CPA-DD-Form" "Do not include data that are calculated with equations provided in the applied methodologies or default values specified in the methodologies in the compilation." EF _{projected_fossilfuel} , AF and Leakage _{charcoal} are the default values from the AMS II.G methodology and do not required to keep in the ex-ante data parameters.				
Documentation provided by CME				
-				
DOE assessment				Date: 06/05/2021
The justification provided by the CME is found acceptable. Hence, the finding is closed.				

Table 2. FAR from this verification

No FAR from this verification

FAR ID	Xx	Section No.		Date: DD/MM/YYYY
Description of FAR				

CME response	Date: DD/MM/YYYY
Documentation provided by CME	
DOE assessment	Date: DD/MM/YYYY

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Document information

<i>Version</i>	<i>Date</i>	<i>Description</i>
04.0	6 April 2021	Revision to: <ul style="list-style-type: none"> Reflect the “Clarification: Regulatory requirements under temporary measures for post-2020 cases” (CDM-EB109-A01-CLAR).
03.0	31 May 2019	Revision to: <ul style="list-style-type: none"> Ensure consistency with version 02.0 of the “CDM validation and verification standard for programmes of activities” (CDM-EB93-A08-STAN); Make structural and editorial improvements.
02.0	29 December 2017	Revision to align with the requirements of the “CDM validation and verification standard for programme of activities” (version 01.0).
01.0	5 June 2015	Initial publication.
Decision Class: Regulatory Document Type: Form Business Function: Issuance Keywords: programme of activities, verifying and certifying		