



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

Complete this form in accordance with the instructions attached at the end of this form.

BASIC INFORMATION

Title and UNFCCC reference number of the programme of activities (PoA)	Improved Cooking Stoves in Bangladesh UNFCCC ID: 4791	
Version number(s) of the PoA-DD(s) to which this report applies	7.1	
Version number of the verification and certification report	1.0	
Completion date of the verification and certification report	20/11/2020	
Monitoring period number and duration of this monitoring period	3 (Third monitoring period) 13/01/2017 – 12/01/2020 (both days included)	
Number and version number of the monitoring report to which this report applies	1.0 Version 2.0	
Coordinating/managing entity (CME)	Grameen Shakti	
Host Parties	Host Parties of the PoA	Is this a host Party to a CPA covered in this report?(yes/no)
	People's Republic of Bangladesh	Yes
Applied methodologies and standardized baselines	AMS II.G. – “Energy efficiency measures in thermal applications of non-renewable biomass” (version 03) Standardized Baseline: Not applicable	
Mandatory sectoral scopes	3: Energy Demand	
Conditional sectoral scopes, if applicable	N/A	
Estimated amount of GHG emission reductions or GHG removals for this monitoring period in the included CPAs covered in this report	1,182,348 tCO ₂ e	
Certified amount of GHG emission reductions or GHG removals for this monitoring period for the included CPAs covered in this report	1,086,836 tCO ₂ e	
Name and UNFCCC reference number of the DOE	TÜV NORD CERT GmbH E-0022	
Name, position and signature of the approver of the verification and certification report	Final Approver Stefan Winter	

SECTION A. Executive summary

Grameen Shakti (GS) has commissioned the TÜV NORD JI/CDM Certification Program to carry out the 3rd periodic verification of the CDM Programme of Activities(PoA):

“Improved Cooking Stoves in Bangladesh”

with regard to the relevant requirements for CDM PoAs.

This verification covers the period from 13/01/2017 – 12/01/2020 (both days).

The PoA reduces GHG emissions by disseminating high efficiency biomass-based improved cookstoves (ICS), popularly coined as Bondhu Chula under following two categories in Bangladesh:

- Domestic ICS
- Non – Domestic (Commercial) ICS

The ICS are constructed from brick and/or concrete and have provisions like grates and chimney with cap. The improvement in thermal efficiency is achieved by properly designing the dimensions of the combustion chamber and ensuring effective air flow during cooking. They are designed to draw off smoke and toxins, thus creating cleaner indoor air for women and children. The CPAs under the PoA aid in reducing greenhouse gas (GHG) emissions by replacing traditional wood-fuel three stone stoves with wood-fuel ICS. The replacement of traditional stoves by ICS improves heat transfer to the cooking utensil thereby reducing the amount of fuel (non-renewable biomass) required for cooking. A reduction in consumption of non-renewable biomass contributes towards reduction in GHG emissions into the atmosphere. Thus, ICS reduce GHG emissions through their improved thermal efficiency as compared to traditional/ baseline stoves. The PoA includes 19 CPAs with reference number 4791-P1-0001-CP1 to 4791-P1-0019-CP1. This monitoring report covers the emission reductions achieved by 8 CPAs with reference numbers 4791-P1-0012-CP1 to 4791-P1-0019-CP1.

Under the CPAs (4791-P1-0012-CP1 to 4791-P1-0019-CP1), 433,052 Domestic ICS and 4,164 Non-Domestic ICS have been installed in Bangladesh, replacing the inefficient traditional three-stone-fired stoves used in the baseline scenario.

The Verification Team has checked the latest [Modalities of Communication \(MoC\)](#) statement and confirms that this program is managed by Grameen Shakti (GS) as the Coordinating/Managing Entity (CME). GS coordinates with different CPA implementers, as applicable. The PoA is a voluntary action by the CME. The CPAs 4791-P1-0012-CP1 to 4791-P1-0019-CP1 have been implemented by SZ Consultancy Services Limited (SZCSL).

Details of the CPA location are given in table A-1 below:

Table A-1: Project Location of CPAs (4791-P1-0012-CP1 to 4791-P1-0019-CP1)
: Improved Cooking Stoves in Bangladesh

No.	Project Location
Host Country	People's Republic of Bangladesh
Region:	All across Bangladesh
Project location address:	Whole country where CPAs are implemented

Basic technical details of the CPA are summarized in table A-2.

Table - A-2: Technical data of the CPA: Improved Cooking Stoves in Bangladesh

Parameter	Unit	Value
Average Thermal Efficiency ¹	%	Domestic: 28.85; Non-domestic: 24.30
Portable/Fixed	-	Fixed with fuel grate (Domestic/Non-Domestic)
Materials	-	Cement concrete with Chimney

¹ Technical Specifications

Producer	-	SZCSL
Design operational life-time	Year	9-10 years

As a result of this verification, the verifier confirms that:

- all operations of the CPAs (4791-P1-0012-CP1 to 4791-P1-0019-CP1) are implemented and installed as planned and described in the included component project activities design document.
- the monitoring plan is in accordance with the applied approved CDM methodology, i.e., AMS-II.G. ver. 03
- the equipment essential for measuring parameters required for calculating emission reductions are calibrated appropriately.
- the monitoring system is in place and functional. The CPA has generated GHG emission reductions.

As the result of the 3rd periodic verification of CPAs (4791-P1-0012-CP1 to 4791-P1-0019-CP1), the verifier confirms that the GHG emission reductions are calculated without material misstatements in a conservative and appropriate manner. TÜV NORD JI/CDM CP herewith confirms that the project has achieved emission reductions in the above-mentioned reporting period as follows:

Emission reductions achieved during the monitoring period: **1,086,836 tCO_{2e}**

SECTION B. Verification team, technical reviewer and approver

B.1. Verification team members

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)	Involvement in			
						Desk/ document review	On-site inspection	Interview(s)	Verification findings
1.	Team Leader+ Technical Expert	IR	Mishra	Prakash Kumar	TÜV NORD CERT	x	x	x	x

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

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)
1.	Technical Reviewer	EI	Lubanga	David	-
2.	Approver	IR	Winter	Stefan	TÜV NORD CERT

SECTION C. Application of materiality in conducting the verification

C.1. Consideration of materiality in planning the verification

In order to ensure a complete, transparent and timely execution of the verification task the team leader has planned the complete sequence of events necessary to arrive at a substantiated final verification opinion.

Various tools have been established in order to ensure an effective verification planning.

Materiality Threshold

The verification is based on the materiality threshold identified in table C-1 below:

Table C-1: Applied Materiality Threshold

	Threshold	Related to
☐	0.5 %	Emission reductions or removals for registered CDM project activities achieving a total emission reduction or removal equal to or more than 500,000 tonnes of carbon dioxide equivalent per year ² ;
☐	1 %	Emission reductions or removals for registered CDM project activities achieving a total emission reduction or removal of between 300,000 and 500,000 tonnes of carbon dioxide equivalent per year;
☐	2 %	Emission reductions or removals for registered large-scale CDM project activities achieving a total emission reduction or removal of 300,000 tonnes of carbon dioxide equivalent per year or less;
☒	5 %	Emission reductions or removals for registered small-scale CDM PoA other than registered CDM PoA covered under next category below;
☐	10 %	Emission reductions or removals for the type of registered small-scale CDM PoA referred to in decision 3/CMP.6, paragraph 38 (referred to as microscale project activities).

Strategic Analysis

At the beginning of the verification the verification team leader has assessed the nature, scale and complexity of the verification tasks by carrying out a strategic analysis of all activities relevant to the project activity. The team leader has collected and reviewed the information relevant to assess that the designated verification team is sufficiently competent to carry out the verification and to ensure that it is able to conduct the necessary risk analysis.

Risk analysis and detailed audit testing planning

For the identification and assessment of potential reporting risks and to determine the necessary detailed audit testing procedures for residual risk areas the following table is used.

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.	Analysis and transfer of data from monitoring documents (installation database, household usage Survey and WBT Records) for parameters under monitoring, to MR and excel ER spreadsheet.	Low	Human error during transfer of data from Usage Survey records and WBT records/sheet for BE, PE and ER calculations	Thorough cross-check and assessment required on the generation and transfer of data to the ER spreadsheet. Assessment of Usage Survey records for Usage rate, and WBT records/protocol/sheet for thermal efficiency, continued use of baseline stoves, appropriateness of sampling plan etc.

On the basis of the risk analysis the verification has been planned. A detailed audit / verification plan has been prepared and submitted to the project participant(s) in due time before the remote assessment.

C.2. Consideration of materiality in conducting the verification

Based on the verification planning, verification process is carried out. The concept of materiality considered during the verification process. A breakdown of the chosen approaches is included in the following table.

Parameter	Approach ⁺	Errors [*] detected	Findings reference	Corrected	Remaining verification risk
η_{new} (Efficiency of the system being deployed as part of	SPL	☒	CL 01, CAR 03	☒	Not material

² A year refers to a period of 12 consecutive months.

Parameter	Approach*	Errors* detected	Findings reference	Corrected	Remaining verification risk
the project activity)					
N _{all} (Total number of stoves installed)	CDC	☒	CAR 01 CAR 02, CAR 03	☒	Not material
SOF (ICS Operation Fraction - To determine only ICS that are still operating, measured ex-post through survey/ user feedback)	SPL	☒	CAR 01, CAR 02, CAR 03 CAR 04	☒	Not material
Aggregate				Materiality threshold not exceeded	

*) incl. omissions and misstatements

*) Verification Approaches:

CDC: Complete data check of data including all data aggregation steps

NDC: Non-complete data check – omissions not material

SPL: Sampling approach (all data available)

ASP: Acceptance Sampling

COM: Data check at higher data aggregation levels and sampling at original data levels

For above risk mentioned in section C.1, the verification team has conducted a thorough cross check and verification as follows:

I. Analysis and transfer of data from sales records, household usage Survey and WBT Reports for parameters under monitoring to MR and excel ER spreadsheet:

Total sales summary presented in ER calculation spreadsheet and MR were assessed and verified against the evidences submitted by SZCSL during desk review and during remote audit assessment³. SZCSL conducted sampling surveys in accordance with the registered monitoring plan. The verification team assessed the monitoring data collected by SZCSL, every year, to determine the total systems deployed in the PoA, proportion of deployed systems in operation and thermal efficiency of systems deployed, in accordance with registered monitoring plan (Annual monitoring) and found them to acceptable without material misstatements. The verification team reviewed and verified available data at SZCSL office (Detailed Installation database with end user details, Usage Survey records, WBT records etc.) against which CERs are claimed under the current monitoring period. Verification team assessed the value of parameters monitored ((N_{all}, SoF and η_{new}) against the Installation / survey / WBT records presented to the verification team by SZCSL and found the appropriate and consistent. The monitoring period consists of three annual monitoring events (MS#1, MS#2 and MS#3) pertaining to the annual monitoring periods 13 Jan 2017 – 12 Jan 2018, 13 Jan 2018 – 12 Jan 2019 and 13 Jan 2019 – 12 Jan 2020 respectively. The monitoring for parameters SOF and η_{new} was conducted in MS#1 (Surveys and Water Boiling Tests) during 14-01-2018 to 05-02-2018, in MS#2 (Surveys and Water Boiling Tests) during 14-01-2019 to 12-02-2019 and in MS#3 (Surveys and Water Boiling Tests) during 14-01-2020 to 16-02-2020. The monitoring records have been assessed and cross-checked with observations during online video calls and interview responses received from the sampled project users during remote assessment. The value of η_{new} i.e. “Efficiency of the system being deployed as part of the project activity” was verified against corresponding WBT test Records submitted for MS#1, MS#2 and MS#3. Based on the above, verification team has issued findings (CAR/CLs) which can be referred in the tables above and in Appendix-4 and Appendix-5 of this report. Certain data was assessed to be inconsistent (Inconsistent values of project stoves in databases and ER/MRs; please refer the corresponding findings under Appendix-4).

³ Refer section D.2 for details of Remote audit assessment

SECTION D. Means of verification**D.1. Desk/document review**

During the desk review all documents initially provided by the client and publicly available documents relevant for the verification were reviewed. The main documents are listed below:

- Registered PoA-DD including the monitoring plan^{/PoA-DD/},
- PoA Validation Report^{/VAL/}
- Registered CPA-DDs^{/CPA-DD/}
- CPA validation reports^{/VAL/},
- The monitoring report, including the claimed emission reductions for the PoA^{/MR/},
- Field Monitoring Records and related work sheets^{/RC/}
- Water Boiling Test Records^{/WBT/} and related work sheets
- The emission reduction calculation spreadsheet^{/XLS/}.
- CPA Distribution Records[/] and Sales Receipts^{/SSQ/}
- Sample size calculation spreadsheet for Usage Survey and WBT^{/RC/}
- Total Installation Database^{/DB/}

Other supporting documents, such as publicly available information on the UNFCCC website and background information were also reviewed.

D.2. On-site inspection/ Remote Assessment

A remote audit was conducted using alternate means of verification due to Pandemic of COVID-19 and related lockdown in the host country of Bangladesh. Detailed explanation on remote audit is provided below.

Duration of remote-site inspection: 23/06/2020				
No	Activity performed on-site	Site location	Date	Team member
1.	• Assessment of the ICS installation database • Assessment of sample end-user/customer's agreements • Comparison of end-user/customer's agreements with information in the database (date of installation, ICS category (domestic/non-domestic), ICS unique serial number, name of user, address, location etc.) • Assessment of data management system, QA/QC procedures • Interviews with CME and SZCSL management • Interview with operation manager of SZCSL/CPA implementer • Interviews with CME representative • Discussion of emission reductions and supporting documentation • Video Telephonic interview with Field Survey team, WBT expert team and Stove manufacturing Partners	SZCSL office (remotely) Dhaka Bangladesh	21/09/2020 – 23/09/2020	Prakash Kumar Mishra (PKM)
2.	Virtual visit of randomly selected households via video calls	Stove users house and non-domestic in Bangladesh at different locations sampled (remote video calls)	21/09/2020 – 23/09/2020	
3.	Discussion on MR and supporting documents and final closing meeting	SZCSL/consultant /PP	21/09/2020 – 23/09/2020	

Remote audit assessment:

Due to the COVID-19 pandemic there was a complete lockdown in the Host Country of Bangladesh where movement in the field was not permitted and hence Verification Team, in line with UNFCCC INQ-09667 (email reply from Secretary to The CDM Executive Board, dated 20/03/2020 where agreement to relax mandatory site visit by DOE for period of 03 months which was further extended up to December 2020⁴. The extension was conditionally permitted to apply alternative and credible means of verification. The Verification Team has presented the reasoning to demonstrate the fulfilment of conditions to initiate the Remove Audit Assessment:

Sr. No	Condition	Applicable (Y/N)	Justification
1.	Para 321 of VVS-PS It is mandatory for the DOE to conduct an on-site inspection at verification for the included CPA if: (a) It is the first verification for the DOE with regard to this CPA; (b) More than three years have elapsed since the last on-site inspection conducted for verification for the CPA; or (c) The CPA has achieved more than 300,000 t CO ₂ e.q. of GHG emission reductions or net anthropogenic GHG removals since the last verification when an on-site inspection was conducted.	Y	The verification for the CPAs 12 to CPA-19 is undergoing the third periodic verification with more than 300,000 tCO ₂ . The last verification site visit was undertaken on date 16/09/2017 to 19/09/2017, which is more than 03 years old. Thus, the site visit is mandatory as per § 321 (c). Justification of alternative, credible and sufficient means for the purpose of verification of on-ground information is provided in detail below under para "Applied Alternate Credible means of verification"
Justification to avail temporary measures as per agreement to relax mandatory site visit by DOE			
2.	Can the site visits be postponed	N	Client has the delivery deadlines of CER's so postponing site visit will negatively impact the CER delivery commitment by CME. Thus, site visit cannot be postponed.
3.	Is it possible to travel to host country Bangladesh and undertake site visits	N	Global Travel Ban is not allowing the VT to visit to Host country Bangladesh.

Applied Alternate Credible means of verification:

The credible alternate means of verification is applied to cross-check on-ground information as described below:

Photographs of sampled stove users: These include the photos of the actual monitored end users which are utilized to verify the information stated in the survey records e.g. demonstrating implementation of the project ICS (Domestic/Non-Domestic), continuous use of baseline stove (if any), ICS serial number, ICS model etc. The photograph records are stored in the QMS system of DOE; these records are retrievable and assessable.

Skype Video Calls (Recorded): This tool has allowed to connect multiple stakeholders such as CME, CPA Implementer, consultant, relevant personnel from monitoring survey team and the WBT Team, all other relevant persons as per the organogram of the PoA/ CPA including QA/ QC key personnel and sampled end users. The VT could virtually verify the implementation of the project against the requirements in the registered CPAs via interviews with all the above-mentioned parties including sampled ICS end users using this tool. The selected end users were interviewed by the verification team to verify individual end user records in the ICS installation database (ICS unique serial number, ICS category, date of installation, ICS usage status, baseline stove usage (if any), WBT performed (as applicable)) submitted by PP and were found correct and consistent with the

⁴ https://cdm.unfccc.int/newsroom/latestnews/releases/2020/01041_index.html

observations made on video calls. The video calls were recorded, stored and maintained so that the assessments of the Verification Team are traceable and reproducible if required.

Furthermore, the data collected above are further utilized for assessments which is described in relevant parts of the Verification Report

D.3. Interviews

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1.	Md.	Khalequzzaman	CPA (SZCSL) Implementer-CME Representative	21/09/2020	CPA development, QM, Organisational structure, QA/QC, raw data, sales database	PKM
2.	Lohia	Rohit	Director (CSIPL)	21/09/2020	MR development, ER calculation and monitoring aspects including Sampling & Survey and WBT analysis	
3.	Kumar	Ritesh	Consultant (CSIPL)	21/09/2020	MR development, ER calculation and monitoring aspects including Sampling & Survey and WBT analysis	
4.	Munira	Sirajum Joya	Communication Officer (SZCSL)	21/09/2020	trainings, Information flow, record keeping, staff training, sales database	
5.	Kumar Saha	Atanu	DGM (SZCSL)	23/09/2020	WBT Procedure, Equipment calibration, Training	
6.	Hossain	Kamal	DGM (SZCSL)	23/09/2020	WBT Procedure, Equipment calibration, Training	
7.	Das	Sonjoy	DSM (SZCSL)	21/09/2020	Stove installation, Data entry, record keeping, sales database	
8.	Jaman	SM Shah	DSM (SZCSL)	21/09/2020	Stove installation, Data entry, record keeping, sales database	
9.	-	Samsuzzaman	DSM (SZCSL)	23/09/2020	Stove installation, Data entry, record keeping, sales database	
10.	Paul	Partho Protim	ADM (SZCSL)	23/09/2020	Stove installation, Data entry, record keeping, sales database	
11.	Islam	Shafiqui	DSM (SZCSL)	23/09/2020	Stove installation, Data entry, record keeping, sales database	
12.	Hossain	Monawal	ADM(SZCSL)	23/09/2020	Stove installation, Data entry, record keeping, sales database	
13.	-	Md. Jaidul	Commercial Stove User (MS#1 Survey Sample)	21/09/2020	Date of installation, number of persons served, number of stoves (ICS and any other) in the Non-Domestic facility, Usage rate, Stove performance, Use of baseline stove, as applicable etc.	
14.	-	Md. Samarat	Domestic Stove User (MS#1 Survey +WBT Sample)	21/09/2020	Date of installation, number of persons in household, number of stoves (ICS and any other) in the household, Usage rate, Stove performance, Use of baseline stove, as applicable etc.	
15.	Benarg	Sanker	Domestic Stove	21/09/2020	Date of installation, number	

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
	y		User (MS#1 Survey +WBT Sample)		of persons in household, number of stoves (ICS and any other) in the household, Usage rate, Stove performance, Use of baseline stove, as applicable etc.	
16.	Khatun	Sahera	Domestic Stove User (MS#1 Survey +WBT Sample)	21/09/2020	Date of installation, number of persons in household, number of stoves (ICS and any other) in the household, Usage rate, Stove performance, Use of baseline stove, as applicable etc.	
17.	Alam	Mohammod	Domestic Stove User (MS#1 Survey +WBT Sample)	21/09/2020	Date of installation, number of persons in household, number of stoves (ICS and any other) in the household, Usage rate, Stove performance, Use of baseline stove, as applicable etc.	
18.	Molla	Md. Amij	Commercial Stove User (MS#1 Survey Sample)	21/09/2020	Date of installation, number of persons served, number of stoves (ICS and any other) in the Non-Domestic facility, Usage rate, Stove performance, Use of baseline stove, as applicable etc.	
19.	Dotto	Kollan	Commercial Stove User (MS#1 Survey +WBT Sample)	21/09/2020	Date of installation, number of persons served, number of stoves (ICS and any other) in the Non-Domestic facility, Usage rate, Stove performance, Use of baseline stove, as applicable etc.	
20.	-	Md. Altab	Commercial Stove User (MS#1 Survey +WBT Sample)	21/09/2020	Date of installation, number of persons served, number of stoves (ICS and any other) in the Non-Domestic facility, Usage rate, Stove performance, Use of baseline stove, as applicable etc.	
21.	-	Shofiuddin	Commercial Stove User (MS#1 Survey +WBT Sample)	21/09/2020	Date of installation, number of persons served, number of stoves (ICS and any other) in the Non-Domestic facility, Usage rate, Stove performance, Use of baseline stove, as applicable etc.	
22.	Shakh	Altab	Commercial Stove User (MS#1 Survey +WBT Sample)	21/09/2020	Date of installation, number of persons served, number of stoves (ICS and any other) in the Non-Domestic facility, Usage rate, Stove performance, Use of baseline stove, as applicable etc.	
23.	Kumar	Mondol Son of Nikhil Biswas	Commercial Stove User (MS#1 Survey +WBT Sample)	21/09/2020	Date of installation, number of persons served, number of stoves (ICS and any other) in the Non-Domestic facility,	

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
					Usage rate, Stove performance, Use of baseline stove, as applicable etc.	
24.	-	Daughter-in-Law of Dipu Rani Das	Domestic Stove User (MS#1 Survey +WBT Sample)	21/09/2020	Date of installation, number of persons in household, number of stoves (ICS and any other) in the household, Usage rate, Stove performance, Use of baseline stove, WBT tests, as applicable etc.	
25.	-	Rekha Daughter-in-law of Gopal Biswas	Domestic Stove User (MS#1 Survey +WBT Sample)	21/09/2020	Date of installation, number of persons in household, number of stoves (ICS and any other) in the household, Usage rate, Stove performance, Use of baseline stove, WBT tests, as applicable etc.	
26.	-	Shahin	Commercial Stove User (MS#1 Survey Sample)	21/09/2020	Date of installation, number of persons served, number of stoves (ICS and any other) in the Non-Domestic facility, Usage rate, Stove performance, Use of baseline stove, as applicable etc.	
27.	Islam	Shahidul Brother of Md. Nurul Haque Ahajari	Domestic Stove User (MS#1 Survey Sample)	21/09/2020	Date of installation, number of persons in household, number of stoves (ICS and any other) in the household, Usage rate, Stove performance, Use of baseline stove, WBT tests, as applicable etc.	
28.	Gazi	Enayak Husband of Hira Bibi	Domestic Stove User (MS#1 Survey + WBT Sample)	21/09/2020	Date of installation, number of persons in household, number of stoves (ICS and any other) in the household, Usage rate, Stove performance, Use of baseline stove, WBT tests, as applicable etc.	
29.	Begum	Anora Mother of Epi Molla	Domestic Stove User (MS#2 Survey +WBT Sample)	22/09/2020	Date of installation, number of persons in household, number of stoves (ICS and any other) in the household, Usage rate, Stove performance, Use of baseline stove, WBT tests, as applicable etc.	
30.	-	Sukchak Mother of Rubel Hosen	Domestic Stove User (MS#2 Survey +WBT Sample)	22/09/2020	Date of installation, number of persons in household, number of stoves (ICS and any other) in the household, Usage rate, Stove performance, Use of baseline stove, WBT tests, as applicable etc.	
31.	Mondol	Harendrana	Domestic Stove	22/09/2020	Date of installation, number	

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
		th Husband of Monika Mondal	User (MS#2 Survey +WBT Sample)		of persons in household, number of stoves (ICS and any other) in the household, Usage rate, Stove performance, Use of baseline stove, WBT tests, as applicable etc.	
32.	Begum	Md. Sjhila	Domestic Stove User (MS#2 Survey +WBT Sample)	22/09/2020	Date of installation, number of persons in household, number of stoves (ICS and any other) in the household, Usage rate, Stove performance, Use of baseline stove, WBT tests, as applicable etc.	
33.	-	Md. Saddam	Commercial Stove User (MS#2 Survey +WBT Sample)	22/09/2020	Date of installation, number of persons served, number of stoves (ICS and any other) in the Non-Domestic facility, Usage rate, Stove performance, Use of baseline stove, as applicable etc.	
34.	Amin	Ala	Commercial Stove User (MS#2 Survey +WBT Sample)	22/09/2020	Date of installation, number of persons served, number of stoves (ICS and any other) in the Non-Domestic facility, Usage rate, Stove performance, Use of baseline stove, as applicable etc.	
35.	Mollik	Md.Lalu	Commercial Stove User (MS#2 Survey +WBT Sample)	22/09/2020	Date of installation, number of persons served, number of stoves (ICS and any other) in the Non-Domestic facility, Usage rate, Stove performance, Use of baseline stove, as applicable etc.	
36.	Ali	Md.Rashel	Commercial Stove User (MS#2 Survey +WBT Sample)	22/09/2020	Date of installation, number of persons served, number of stoves (ICS and any other) in the Non-Domestic facility, Usage rate, Stove performance, Use of baseline stove, as applicable etc.	
37.	-	Rakib Son of Md. Shalaman Sheak	Commercial Stove User (MS#2 Survey +WBT Sample)	22/09/2020	Date of installation, number of persons served, number of stoves (ICS and any other) in the Non-Domestic facility, Usage rate, Stove performance, Use of baseline stove, as applicable etc.	
38.	Begum	Sajeda Wife of Md. Rahamat Ali	Domestic Stove User (MS#2 Survey +WBT Sample)	22/09/2020	Date of installation, number of persons in household, number of stoves (ICS and any other) in the household, Usage rate, Stove performance, Use of baseline stove, WBT tests, as applicable etc.	
39.	Islam	Md. Samsul	Commercial	22/09/2020	Date of installation, number	

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
		Teacher at Joypurhat Cadet Madrasah	Stove User (MS#2 Survey Sample)		of persons served, number of stoves (ICS and any other) in the Non-Domestic facility, Usage rate, Stove performance, Use of baseline stove, as applicable etc.	
40.	-	Boshu	Commercial Stove User (MS#2 Survey Sample)	22/09/2020	Date of installation, number of persons served, number of stoves (ICS and any other) in the Non-Domestic facility, Usage rate, Stove performance, Use of baseline stove, as applicable etc.	
41.	Mollah	Ibrahim	Commercial Stove User (MS#2 Survey +WBT Sample)	22/09/2020	Date of installation, number of persons served, number of stoves (ICS and any other) in the Non-Domestic facility, Usage rate, Stove performance, Use of baseline stove, as applicable etc.	
42.	Biswas	Dinesh	Commercial Stove User (MS#2 Survey +WBT Sample)	22/09/2020	Date of installation, number of persons served, number of stoves (ICS and any other) in the Non-Domestic facility, Usage rate, Stove performance, Use of baseline stove, as applicable etc.	
43.	-	Rashidul	Domestic Stove User (MS#2 Survey +WBT Sample)	22/09/2020	Date of installation, number of persons in household, number of stoves (ICS and any other) in the household, Usage rate, Stove performance, Use of baseline stove, WBT tests, as applicable etc.	
44.	Mondol	Khalida	Domestic Stove User (MS#2 Survey +WBT Sample)	22/09/2020	Date of installation, number of persons in household, number of stoves (ICS and any other) in the household, Usage rate, Stove performance, Use of baseline stove, WBT tests, as applicable etc.	
45.	-	Wife of Md. Ataur rahman	Domestic Stove User (MS#2 Survey +WBT Sample)	22/09/2020	Date of installation, number of persons in household, number of stoves (ICS and any other) in the household, Usage rate, Stove performance, Use of baseline stove, WBT tests, as applicable etc.	
46.	-	Soref	Domestic Stove User (MS#3 Survey +WBT Sample)	22/09/2020	Date of installation, number of persons in household, number of stoves (ICS and any other) in the household, Usage rate, Stove performance, Use of baseline stove, WBT tests, as applicable etc.	

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
47.	Khatun	Sajeda Daughter-in-law of Latif	Domestic Stove User (MS#3 Survey +WBT Sample)	22/09/2020	Date of installation, number of persons in household, number of stoves (ICS and any other) in the household, Usage rate, Stove performance, Use of baseline stove, WBT tests, as applicable etc.	
48.	-	Halimon	Domestic Stove User (MS#3 Survey Sample)	22/09/2020	Date of installation, number of persons in household, number of stoves (ICS and any other) in the household, Usage rate, Stove performance, Use of baseline stove, WBT tests, as applicable etc.	
49.	-	Sabina Wife of Julhas Mia	Domestic Stove User (MS#3 Survey +WBT Sample)	22/09/2020	Date of installation, number of persons in household, number of stoves (ICS and any other) in the household, Usage rate, Stove performance, Use of baseline stove, WBT tests, as applicable etc.	
50.	Khatun	Sahanara	Domestic Stove User (MS#3 Survey +WBT Sample)	22/09/2020	Date of installation, number of persons in household, number of stoves (ICS and any other) in the household, Usage rate, Stove performance, Use of baseline stove, WBT tests, as applicable etc.	
51.	-	Kinaram	Domestic Stove User (MS#3 Survey +WBT Sample)	22/09/2020	Date of installation, number of persons in household, number of stoves (ICS and any other) in the household, Usage rate, Stove performance, Use of baseline stove, WBT tests, as applicable etc.	
52.	-	Salma Mother of Sonia	Domestic Stove User (MS#3 Survey +WBT Sample)	22/09/2020	Date of installation, number of persons in household, number of stoves (ICS and any other) in the household, Usage rate, Stove performance, Use of baseline stove, WBT tests, as applicable etc.	
53.	Golddar	Rita Daughter-in-law of Sonia	Domestic Stove User (MS#3 Survey +WBT Sample)	22/09/2020	Date of installation, number of persons in household, number of stoves (ICS and any other) in the household, Usage rate, Stove performance, Use of baseline stove, WBT tests, as applicable etc.	
54.	Haque	Fazlu	Commercial Stove User (MS#3 Survey	23/09/2020	Date of installation, number of persons served, number of stoves (ICS and any other) in	

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
			Sample)		the Non-Domestic facility, Usage rate, Stove performance, Use of baseline stove, as applicable etc.	
55.	-	Md. Asraful	Commercial Stove User (MS#3 Survey Sample)	23/09/2020	Date of installation, number of persons served, number of stoves (ICS and any other) in the Non-Domestic facility, Usage rate, Stove performance, Use of baseline stove, as applicable etc.	
56.	Pramanik	Sujon	Commercial Stove User (MS#3 Survey +WBT Sample)	23/09/2020	Date of installation, number of persons served, number of stoves (ICS and any other) in the Non-Domestic facility, Usage rate, Stove performance, Use of baseline stove, as applicable etc.	
57.	Biswas	Helal Brother of Jamal Biswas	Commercial Stove User (MS#3 Survey +WBT Sample)	23/09/2020	Date of installation, number of persons served, number of stoves (ICS and any other) in the Non-Domestic facility, Usage rate, Stove performance, Use of baseline stove, as applicable etc.	
58.	Munsi	Mokhlesh	Commercial Stove User (MS#3 Survey +WBT Sample)	23/09/2020	Date of installation, number of persons served, number of stoves (ICS and any other) in the Non-Domestic facility, Usage rate, Stove performance, Use of baseline stove, as applicable etc.	
59.	Mia	Md. Mintu	Commercial Stove User (MS#3 Survey +WBT Sample)	23/09/2020	Date of installation, number of persons served, number of stoves (ICS and any other) in the Non-Domestic facility, Usage rate, Stove performance, Use of baseline stove, as applicable etc.	
60.	Gosh	Dipak	Commercial Stove User (MS#3 Survey +WBT Sample)	23/09/2020	Date of installation, number of persons served, number of stoves (ICS and any other) in the Non-Domestic facility, Usage rate, Stove performance, Use of baseline stove, as applicable etc.	
61.	Nandi	Mintu Kumar	Commercial Stove User (MS#3 Survey +WBT Sample)	23/09/2020	Date of installation, number of persons served, number of stoves (ICS and any other) in the Non-Domestic facility, Usage rate, Stove performance, Use of baseline stove, as applicable etc.	

D.4. Sampling approach

D.4.1 Sampling during monitoring:

☐	No sampling approach has been used by the PP to determine the monitored parameters
☒	A sampling approach has been taken for the following monitored parameter(s):

	Parameter	Sampling approach ¹⁾	Sampling Type ²⁾	Population		Sample Size	
				Strata	Population	Sample required	Samples covered
	η_{new}	StRS	PS	Domestic			
				MS1	433,052	7	9
				MS2	433,052	7	8
	SOF	StRS	PS	MS3	433,052	7	9
				MS1	433,052	43	53
				MS2	433,052	55	63
				MS3	433,052	68	71
				Non-Domestic			
				MS1	4,164	7	7
				MS2	4,164	7	7
	η_{new}	StRS	PS	MS3	4,164	7	7
				MS1	4,164	30	36
				MS2	4,164	32	36
	SOF	StRS	PS	MS3	4,164	43	45

¹⁾ Sampling Approaches:

SiRS: Simple Random Sampling
 StRS: Stratified Random Sampling
 SS: Systematic Sampling
 CS: Cluster Sampling
 MSS: Multi-stage Sampling

²⁾ Sampling Types:

PS: Parameter Sampling

Sampling design

- Objectives and reliability: The objective is to determine the value of parameters of interest of project stoves during the monitoring period with a 95/10 confidence/precision.
- Target population: Project households with Bondhu Chulha installed (Domestic: 433,052; Non-Domestic: 4,164).
- Sampling methods: a simple random sampling approach, separately for each ICS Category (Domestic/Non-Domestic), individually for each of the three monitoring events MS#1, MS#2 and MS#3, was applied for sampling.
- The end user data (including, unique ICS ID and specific ICS location) has been made available to the verification team for each ICS in the population (Domestic: 433,052; Non-Domestic: 4,164) as verified from the installation database maintained at the SZCSL office.
- Sample size: the sample size is calculated based on developer's knowledge and experience in line with para 13(b) and 13(c) of the Sampling and surveys for CDM project activities and programmes of activities, Version 8.0 and registered CPA-DDs section E.7.

The required sample size for mean based parameter (η_{new}) has been derived using equation (4), (5) & (6) of Appendix 2 of the Guideline: Sampling and surveys for CDM project activities and programmes of activities, Version 04.0 as follows:

$$n \geq \frac{z^2 * N * V}{(N-1) * precision^2 + z^2 * V}$$

Where,

n = number of ICS to be sampled

N = Total number of ICS in the population

Z = Constant referring to level of confidence (1.96 for 95 % confidence)

Precision = Required precision (e.g. 10% = 0.1)

$$V = \left(\frac{SD}{Mean} \right)^2$$

Where

SD = expected standard deviation of the ICS population

Mean = expected mean of the ICS population

The required sample sizes for proportion-based parameter (SOF) has been derived using equation (1) & (2) of Appendix 2 of the Guideline: Sampling and surveys for CDM project activities and programmes of activities, Version 04.0 as follows:

$$n \geq \frac{z^2 * N * V}{(N-1) * precision^2 + z^2 * V}$$

Where,

n = number of ICS to be sampled

N = Total number of ICS in the population / sampling frame

z = Constant referring to level of confidence (e.g. 1.645 for 90 %; 1.96 for 95 % confidence)

Precision = Required precision (e.g. 10% = 0.1)

$$V = \frac{p(1-p)}{p^2}$$

Where,

p = expected proportion of the population / sampling frame.

The samples sizes based on the registered monitoring plan were determined at 95/10 reliability level for PoA specific sampling) for all the parameters listed above at monitoring frequency prescribed in CPA-DDs. Sample size calculation was assessed to be in accordance with registered sampling plan in PoA-DD/CPA-DD and the guideline "Sampling and surveys for CDM project activities and programme of activities", version 04.0 for sampling. Input parameters for the sampling calculations have been checked for consistency with the stated approach and against registered PoA-DD, CPA-DD and the sampling guidance.

The target population for the two parameters (η_{new} and SOF) stated above are total installed ICS as recorded in the project installation database under two categories i.e. Domestic: 433,052; Non-Domestic: 4,164. For each monitoring session, every individual project stove in the installation database for a given ICS category (observed to be uniquely identifiable via its serial number) was allocated a sample number. Random numbers were generated online to identify the samples randomly from the sampling frame.

CME has submitted sample size calculation spreadsheet and random number generators for each monitoring event (MS#1, MS#2 and MS#3) where it was demonstrated that samples are drawn randomly using simple random sampling approach giving equal chance to every ICS in each sampling frame to get selected for monitoring. Verification Team further has cross-checked the sampling approach by the CME as per MR section E.3 against the registered monitoring plan.

Further, verification team has re-calculated the sample size according to the required confidence/precision and found the sample size correctly calculated. Also, the achieved precision for every parameter was recalculated by the verification team and monitoring results were found to meet the minimum desired confidence and precision levels.

Several findings were raised during course of verification. Please refer Appendix-4 of this report.

D.4.2 Sampling approaches during verification

☐	No sampling approach has been used by the VT to verify the monitored parameters			
☒	A sampling approach has been applied by the VT for the following monitored parameter(s):			
Parameter	Sampling approach ¹⁾	Sampling Type ²⁾	Population	DOE Sample Size

$\eta_{\text{new, MS1}}$	SiRS	AS	16 (9 Domestic, 7 non-Domestic)	12 (7 Domestic, 5 non-Domestic)
$\eta_{\text{new, MS2}}$	SiRS	AS	15 (8 Domestic, 7 non-Domestic)	15 (8 Domestic, 7 non-Domestic)
$\eta_{\text{new, MS3}}$	SiRS	AS	16 (9 Domestic, 7 non-Domestic)	13 (7 Domestic, 6 non-Domestic)
SOF_{MS1}	SiRS	AS	89 (53 Domestic, 36 non-Domestic)	16 (8 Domestic, 8 non-Domestic)
SOF_{MS2}	SiRS	AS	99 (63 Domestic, 36 non-Domestic)	17 (8 Domestic, 9 non-Domestic)
SOF_{MS3}	SiRS	AS	116 (71 Domestic, 45 non-Domestic)	16 (8 Domestic, 8 non-Domestic)

¹⁾Sampling Approaches:

SiRS: Simple Random Sampling
 StRS: Stratified Random Sampling
 SS: Systematic Sampling
 CS: Cluster Sampling
 MSS: Multi-stage Sampling

²⁾Sampling Types:

AS: Acceptance Sampling
 PS: Parameter Sampling
 COM: Full data check at higher data aggregation levels and sampling at original data levels

Since the CPA included in the PoA implements technologies/measures with high degree of standardization and the stove capacities in terms of energy savings per year in the CPAs are smaller than 1% of small scale CDM thresholds, the verification team decided to draw samples from the project samples monitored by PP. i.e. the acceptance sampling approach has been applied.

The verification team followed the guidance in the “Standard for Sampling and Surveys for CDM Project Activities and Programme Activities” version 08, para 29 to 32 and 39 with regards to acceptance sampling approach (AS). The verification Team checked provisions of the para 39 of the applied standard to apply the producer risk and consumer risk following the provision of para 39 as assessed below:

Statement of para 39: <i>A DOE may select a different sample size than the one indicated in paragraph 32 above, either by choosing a different value for the consumer risk and producer risk (e.g. 20 per cent for the consumer risk) when applying acceptance sampling or by using another approach, if any of the following conditions apply:)</i>		
Sr. No.	Requirement of para	DOE Assessment
a)	The estimated volume of annual GHG emission reductions of the project activity or the PoA being verified is equal to or less than 100,000 t CO ₂ eq.;	Not Applicable. The verified emission reductions amount to 1,086,836 tCO₂ .
b)	The security conditions in the project region prevents inspection of many samples (e.g. conflict zones); or	The COVID-19 was declared pandemic by WHO which has created a health situation which was tangible and globally apparent. Thus, the DOE has availed the sampling size accordingly.
c)	The project activity or the PoA is located in a least developed country or a host Party with 10 or fewer registered CDM project activities at the end of the monitoring period being verified	The CPA under PoA are located in the LDC i.e. Host Country Bangladesh as per https://unfccc.int/topics/resilience/workstreams/national-adaptation-programmes-of-action/lcd-country-information

Thus, Verification team has adopted the acceptance sampling approach in accordance with § 29, 30, 31 and 32 of the Sampling Standard by considering AQL 1% and UQL 20%). Producer risk of 10% and consumer risk of 20%. Considering the above § under applied sampling standard, the number of samples required to be verified by the verification team is 08 samples with acceptance (c)

number 0. Thus, for each monitoring event MS#1, MS#2 and MS#3, the verification team randomly selected samples (from PP own samples) for the remote audit giving preference to WBT samples. The list of samples was verified using remote assessment techniques covering CME's/implementer's samples for usage related surveys as well as WBT results under CPAs as presented under section D.3 of this report above.

Table 7: Applied sampling standard

AQL	1%
UQL	20%
Producer risk	10%
Consumer risk	20%
Sample size	8
Acceptance Number	0

No CME monitoring records / data results were found discrepant during the DOE verification remote onsite audit. All the samples reviewed were found to be operational during the remote onsite audit interview / verification conducted by the verification team, and were found to be in line with the PP monitoring records. Details on each ICS sample verified through remote assessment are presented under Section D.3 above. Based on the review of 49 remotely assessed samples, observing records of each sample prepared and submitted by CME before onsite remote assessment, together with video interview of end users, it could be confirmed that the result presented for all the monitored parameters e.g. Usage rate, thermal efficiencies and usage of baseline stove, if any, are reproducible and thus, monitoring results could be confirmed and deemed acceptable. Further, the verification team reviewed all the primary monitoring records before and during remote audit assessment to assess the consistency of information with ER calculation spreadsheet and found the monitoring data to be correctly transcribed into the ER sheet and MR. Based on above assessment, the verification team concludes that monitoring results and values presented by CME in the MR and ER calculation spread sheet and results of survey and WBT records are consistent with the onsite observation and interview with the end users.

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	0	0	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
Programme of activities	-	-	-
Compliance of the programme implementation with the registered PoA-DD	0	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 ⁵	0	0	0
• Changes to the programme design	0	0	0
• Addition of CPA inclusion template	0	0	0

⁵ 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).

Areas of verification findings	No. of CL	No. of CAR	No. of FAR
Change of coordinating/managing entity			
Changes specific to afforestation and reforestation activities	0	0	0
Component project activities	-	-	-
Compliance of the CPA implementation with the included CPA design document	0	0	0
Post-registration changes	-	-	-
Temporary deviations from registered monitoring plan, applied methodologies, standardized baselines or other methodological regulatory documents	0	0	0
Corrections	0	0	0
Changes to the start date-of the crediting period	0	0	0
Inclusion of a monitoring plan	0	0	0
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	0	0
Compliance of monitoring activities with the registered monitoring plan	-	-	-
Data and parameters fixed ex ante or at renewal of crediting period	0	0	0
Data and parameters monitored	1	1	0
Implementation of sampling plan	0	2	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	0	0
Calculation of project GHG emissions or actual net GHG removals by sinks	0	0	0
Calculation of leakage GHG emissions	0	0	0
Summary of calculation of GHG emission reductions or net GHG removals by sinks	0	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	-	-	-
Global stakeholder consultation	0	0	0
Others (please specify)	0	1	0
Total	1	4	0

SECTION E. Verification findings**E.1. General****E.1.1. Compliance of the monitoring report with the monitoring report form**

Means of verification	A draft monitoring report was submitted to the verification team by the CME. The DOE has made this report publicly available prior to the start of the verification activities. No comments were received. By means of the UNFCCC website it has been checked whether the latest applicable MR template CDM-PoA-MR-FORM has been used. Further it has been checked whether the latest instructions for filling out the MR template have been followed. Every section has been checked against the respective guidance. The following sources of information have been used in this context: • /MR/ • /MRT/ • /unfccc/	
Findings	☒	The latest reporting template CDM-PoA-MR-FORM as listed on the UNFCCC website has been used for the Monitoring Report to be uploaded.
	☒	The latest instructions for filling out the MR have been followed. No adverse finding has been identified in the course of this verification.
	☐	The respective requirements have widely been complied with; however; the following issues needed to be addressed in this context:
		-
Conclusion	☒	No CARs/CLs have been raised in this context. No correction was required in the context. The project is in line with the respective requirements.
	☐	The raised CARs/CLs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
		The latest instructions for filling out the MR 3.0 have been followed.

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

During the validation the validating DOE might have raised issues that could not be closed or resolved during the validation stage. For this purpose, FARs might have been raised. Likewise, FARs might have been raised in the course of previous verifications.

In the course of this verification the latest version of the last issued MR^{/MR/} and the PoA Validation report^{/VAL/}, have been checked in order to identify any remaining forward action requests. For the current monitoring period the following applies:

(i) Open issues from validation:

☒	There were no open issues which have been addressed in the latest version of the validation report.
☐	All open issues from the validation have been appropriately addressed in the context of previous verifications.
☐	All issues related to the validation have been appropriately addressed in the course of the current monitoring period (for details please refer to appendix 4)
☐	The following issues related to the validation have not yet been appropriately addressed (for details please refer to appendix 4):

(ii) Open issues from previous verifications:

☐	N/A – as this is the first monitoring period for this CDM project activity.
☒	There were no open issues which have been addressed in the previous verification report
☐	All issues related to the previous verification have been appropriately addressed in the course of the current monitoring period (for details please refer to appendix 4)
	The following issues related to the previous verification have not yet been appropriately addressed (for details please refer to appendix 4):

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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 (yes/no)
Improved Cooking Stoves in Bangladesh – CPA No.001: Grameen Shakti Version:6.1 Ref: 4791-P1-0001-CP1	No	19/07/2011	7.1	No
Improved Cooking Stoves in Bangladesh – CPA No.02 “Grameen Shakti” Version:03 Ref: 4791-P1-0002-CP1	No	06/11/2014	7.1	No
Improved Cooking Stoves in Bangladesh – CPA No.03 “Grameen Shakti” Version:02 Ref: 4791-P1-0003-CP1	No	06/11/2014	7.1	No
Improved Cooking Stoves in Bangladesh – CPA No.04 “Grameen Shakti” Version:02 Ref: 4791-P1-0004-CP1	No	06/11/2014	7.1	No
Improved Cooking Stoves in Bangladesh – CPA No.05 “Grameen Shakti” Version:02 Ref: 4791-P1-0005-CP1	No	06/11/2014	7.1	No
Improved Cooking Stoves in Bangladesh – CPA No.06 “Grameen Shakti” Version:02 Ref: 4791-P1-0006-CP1	No	06/11/2014	7.1	No
Improved Cooking Stoves in Bangladesh – CPA No.07 “Grameen Shakti” Version:02 Ref: 4791-P1-0007-CP1	No	06/11/2014	7.1	No
Improved Cooking Stoves in Bangladesh – CPA No.08 “Grameen Shakti” Version:02 Ref: 4791-P1-0008-CP1	No	06/11/2014	7.1	No
Improved Cooking Stoves in Bangladesh – CPA No.09 “Grameen Shakti” Version:02 Ref: 4791-P1-0009-CP1	No	06/11/2014	7.1	No

Improved Cooking Stoves in Bangladesh – CPA No.10 “Grameen Shakti” Version:02 Ref: 4791-P1-0010-CP1	No	06/11/2014	7.1	No
Improved Cooking Stoves in Bangladesh – CPA No.11 “Grameen Shakti” Version:02 Ref: 4791-P1-0011-CP1	No	06/11/2014	7.1	No
Improved Cooking Stoves in Bangladesh – CPA No.12 “SZ Consultancy Services Ltd.” Version:2.2 Ref: 4791-P1-0012-CP1	Yes	13/01/2016	7.1	Yes
Improved Cooking Stoves in Bangladesh – CPA No.13 “SZ Consultancy Services Ltd.” Version:2.2 Ref: 4791-P1-0013-CP1	Yes	13/01/2016	7.1	Yes
Improved Cooking Stoves in Bangladesh – CPA No.14 “SZ Consultancy Services Ltd.” Version:2.2 Ref: 4791-P1-0014-CP1	Yes	13/01/2016	7.1	Yes
Improved Cooking Stoves in Bangladesh – CPA No.15 “SZ Consultancy Services Ltd.” Version:2.2 Ref: 4791-P1-0015-CP1	Yes	13/01/2016	7.1	Yes
Improved Cooking Stoves in Bangladesh – CPA No.16 “SZ Consultancy Services Ltd.” Version:2.2 Ref: 4791-P1-0016-CP1	Yes	13/01/2016	7.1	Yes
Improved Cooking Stoves in Bangladesh – CPA No.17 “SZ Consultancy Services Ltd.” Version:2.2 Ref: 4791-P1-0017-CP1	Yes	13/01/2016	7.1	Yes
Improved Cooking Stoves in Bangladesh – CPA No.18 “SZ Consultancy Services Ltd.” Version:2.2 Ref: 4791-P1-0018-CP1	Yes	13/01/2016	7.1	Yes
Improved Cooking Stoves in Bangladesh – CPA No.19 “SZ Consultancy Services Ltd.” Version:2.2	Yes	13/01/2016	7.1	Yes

Conclusion	☒	No CARs/CLs have been raised in this context. No correction was required in the context. The project is in line with the respective requirements.
	☐	The raised CARs/CLs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
		On the basis of remote assessment and the reviewed project documentation it can be confirmed that w.r.t. the realized energy efficiency measures, the project has been implemented as described in the registered CPA-DDs.

E.2.2. Implementation and operation of the management system

Means of verification	The verification team carried out remote assessment for the CPAs included during this monitoring period and interviewed key personnel. Interviewees included SZCSL, stove manufacturers, project management team (Database team, SZCSL Staff (AGMs, ADMs, DSMs), monitoring team etc.). It was established that the programme management system has been implemented and operated as described.
Findings	N/A
Conclusion	The CDM PoA is managed by Grameen Shakti (GS) as the CME. SZCSL manages the CPAs covered in the Monitoring report as the CPA Implementer Below important functions are undertaken as part of operational and management plan of the CPAs • Arrangements for training and capacity development for local sales and distribution partner personnel by CME and CPA implementer, • System/procedure to avoid double counting (by aggregating the unique database like ICS Serial numbers, ICS type (domestic/ non-domestic), date of installation, fuel used, CPA number, end user address, contact details) • Provisions to ensure that those operating the CPA are aware and have agreed that their activity is being subscribed to the PoA (Informational material, training social media and contractual agreements as applicable) • Measures for continuous improvement of the PoA management • Ex-post monitoring and maintaining record system for each CPA under the PoA • Conduct on the ground monitoring of end users. Sample size determination, monitoring of samples, development of suitable template to capture the monitoring data, develop the working sheets to analyze the results of monitoring • Verify the monitoring work done to ensure accuracy before submission; review protocols, interview enumerators, spot check data • Assist with the completion of monitoring reports with input • Coordination and communication with the verifier and the UNFCCC Below data checks were undertaken by the Verification Team: • The ICS installation database / customer Database sheet was verified to check the details of the ICS (Domestic/Non-Domestic) (which captured the unique ICS serial ID, CPA No., Date of installation and other details) /DB/, /SUR/, /XLS/ • Consistency check was performed between the installation database and sample end user agreements to confirm that information for ICS installed (ICS Serial Number, ICS type, year of installation, CPA number etc) were internally consistent/DB/, • Check on the avoidance of double counting was initiated by checking the unique IDs of the ICS and it is confirmed that the all the numbers are unique. • The training requirements were verified and deemed as acceptable and in line with the requirements of PoA-DD and CPA-DD/TRG/. • The Organogram was checked and it is noted that Programme Manager at the CME is responsible for QA/QC of the data/IM01/, analysis and subsequent reporting in the monitoring report. The Verification Team confirms that QA/QC procedures were found being followed. • The Verification Team interviewed the SZCSL team responsible for monitoring for sampling techniques, data formats, trainings, competence, and

	undertaking the surveys^{/SUR/, /TRG/, /WBT/}. The Verification Team confirms that appropriate provisions in line with the requirement for the PoA-DD and CPA-DD are being followed. Based on and remote assessments and desk review and web-based and telephonic interviews; DOE has found that the system is in place, appropriate and effective. The management system is implemented as per the registered PoA-DD & CPA-DDs.
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E.2.3. Post-registration changes

E.2.3.1. Corrections

It has been checked whether any corrections to project information or parameters fixed at validation have been approved during this monitoring period or submitted with this monitoring report. The result is summarized in the table below.

☒	During this verification of the current MP no need for corrections has been identified.
☐	The following corrections have been applied:
☐	A related post registration change has been submitted prior to the issuance request.
☐	No related post registration change is submitted along with this issuance request. Please refer to the related PRC report submitted along with this issuance request for further details w.r.t. the assessment of the PRC.

E.2.3.2. Inclusion of a monitoring plan

☒	N/A - as this monitoring plan was part of the registered PoA-DD /CPA-DD
☐	In line with PS § 281 or § 282 the PP has forwarded a monitoring plan to the DOE for validation. No prior approval of the monitoring plan was required as the PP in line with PS § 282 wished to submit the monitoring plan together with the request for issuance for the first monitoring period. Please refer to the related PRC report submitted along with this issuance request for further details w.r.t. the assessment of the PRC.
☐	In line with § 282 the PP submitted a monitoring plan prior to the submission of the request for issuance for validation to the DOE. A DOE has assessed the monitoring plan in line with related VVS requirements and submitted a related PRC report for prior approval. The approval has been received on DD/MM/YYYY via approval number

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

It has been checked whether any permanent changes from the registered monitoring plan (PCfrMP) or applied methodologies (PCfMM) including standardized baselines (PCfSB) have been approved prior or during this monitoring period or submitted with this monitoring report. The result is summarized in the table below.

☒	No PCfrMP, PCfMM or PCfSB have been submitted to the UNFCCC prior to the current monitoring period		
☐	The following PCfrMP, PCfMM or PCfSB have been approved or are under approval by the UNFCCC		
	1	Title	
		Status	☐ under approval; ☐ approved
		Approval	
		Ref. No.	

☒	During the verification of the current MP no need for a PCfMP, PCfMM or PCfSB has been identified. The monitoring plan is in accordance with the approved methodology applied by the PA	
☐	An approval of the following PCfMP, PCfMM or PCfSB is to be requested from the EB for the current MP as appendix 1 of the project standard does not apply.	
	1	Issue:
	2	Issue:
☐	The following PCfMP, PCfMM or PCfSB for which appendix 1 of the PS is applicable have been applied:	
	1	Issue:
	2	Issue:

E.2.3.4. Changes to the programme design

It has been checked whether any changes to the project design (CoPD) have been approved prior or during this monitoring period or submitted with this monitoring report. The result is summarized in the table below.

☒	No CoPD has been submitted to the UNFCCC prior to the current monitoring period	
☐	The following CoPD have been approved or are under approval by the UNFCCC	
	1	Title
		Status ☐ under approval; ☐ approved
		Appr.date
		Ref. No.
	2	Title
		Status ☐ under approval; ☐ approved
		Appr.date
		Ref.No.
☒	During the verification of the current MP no need for a CoPD has been identified. The monitoring plan is in accordance with the approved methodology applied by the PA	
☐	An approval of the following CoPD is to be requested from the EB for the current MP as appendix 1 of the project standard does not apply.	
	1	Issue:
	2	Issue:
☐	The following CoPD for which appendix 1 of the PS is applicable have been applied:	
	1	Issue:
	2	Issue:

E.2.3.5. Addition of CPA inclusion template

N/A

E.2.3.6. Change of coordination/managing entity

Not applicable. The registered PoA-DD mentions Grameen Shakti (GS) as the CME.

E.2.3.7. Changes specific to afforestation and reforestation activities

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

Means of verification	By means of an in-depth review of the latest CPA-DD – as downloaded from the UNFCCC project site - and the checks carried out during remote assessment whether the project has been implemented and operated in line with the latest approved version of the CPA-DD and whether all physical features of the project are in place. The following has been checked: implemented technology i.e. project ICS, project monitoring and implemented monitoring plan in line with approved monitoring plan in the PoA-DD and corresponding CPA-DDs. Further it has been checked if relevant technical equipment of the project activity has been exchanged or modified during the monitoring period and consistent notations of key equipment (meters etc.) in CPA-DD, MR and calculation spreadsheet are applied. Interviews with operational personnel have been carried out, QMS records, maintenance records, instrument specifications were checked in this context. Special focus has further been laid to determine whether a potential phase wise implementation has occurred within the crediting period or any delays with respect to the starting dates have occurred. Further it has been checked whether any observed deviations from the registered project design have been correctly addressed as PRCs. The following sources of information have been used in this context: • /CPA-DD/ • /MR/ • /VVS/ • /XLS/ • /unfccc/
Findings	No findings were raised
Conclusion	The verification team confirms that the CPAs under this MPIII are implemented and operated in line with latest approved versions of CPA-DDs and all physical features of the project 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**

It has been checked whether Temporary deviations from the registered monitoring plan (TDfrMP) or Temporary deviations from monitoring methodology or standardized baseline (TDfMM) have been applied during this monitoring period. The result is summarized in the table below.

☒	No Temporary deviations from the registered monitoring plan (TDfrMP) or Temporary deviations from monitoring methodology or standardized baseline (TDfMM) have been submitted to the UNFCCC prior to the current monitoring period.		
☐	The following TDfrMP or TDfMM have been approved or are under approval by the UNFCCC		
	1	Title	
		Status	☐ under approval; ☐ approved (approval No.:)
		Appr.date	
		Ref. No.	
	2	Title	
		Status	☐ under approval; ☐ approved (approval No.:)
		Appr.date	
		Ref.No.	

☒	During the verification of the current MP no need for a TDfrMP or TDfMM has been identified. The monitoring plan is in accordance with the approved methodology applied by the PA	
☐	An approval of the following TDfrMP or TDfMM is to be requested from the EB for the current MP as appendix 1 of the project standard does not apply. Please refer to the related PRC report submitted along with this issuance request for further details w.r.t. the assessment of the PRC.	
	1	Issue:
	2	Issue:
☐	The following TDfrMP or TDfMM for which appendix 1 of the PS is applicable have been applied:	
	1	Issue:
	2	Issue:

E.3.2.2. Corrections

It has been checked whether any corrections to project information or parameters fixed at validation have been approved during this monitoring period or submitted with this monitoring report. The result is summarized in the table below.

☒	During the verification of the current MP no need for corrections has been identified.	
☐	The following corrections have been applied:	
	1	Issue:
	2	Issue:
	☐ A related post registration change has been submitted prior to the issuance request.	
	☐ A related post registration change is submitted along with this issuance request. Please refer to the related PRC report submitted along with this issuance request for further details w.r.t. the assessment of the PRC.	

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

N/A

E.3.2.4. Inclusion of a monitoring plan

☒	N/A - as this monitoring plan was part of the included CPA-DD
☐	In line with PS § 281 or § 282 the PP has forwarded a monitoring plan to the DOE for validation. No prior approval of the monitoring plan was required as the PP in line with PS § 282 wished to submit the monitoring plan together with the request for issuance for the first monitoring period. Please refer to the related PRC report submitted along with this issuance request for further details w.r.t. the assessment of the PRC.
☐	In line with § 282 the PP submitted a monitoring plan prior to the submission of the request for issuance for validation to the DOE. A DOE has assessed the monitoring plan in line with related VVS requirements and submitted a related PRC report for prior approval. The approval has been received on DD/MM/YYYY via approval number PRC-XXXX-00Z.

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

It has been checked whether any permanent changes from the registered monitoring plan (PCfrMP) or applied methodologies (PCfMM) including standardized baselines (PCfSB) have been approved prior or during this monitoring period or submitted with this monitoring report. The result is summarized in the table below.

☒	No PCfrMP, PCfMM or PCfSB have been submitted to the UNFCCC prior to the current monitoring period		
☐	The following PCfrMP, PCfMM or PCfSB have been approved or are under approval by the UNFCCC		
☐	1	Title	
		Status	☐ under approval; ☐ approved
		Appr.date	
		Ref. No.	
	2	Title	
		Status	☐ under approval; ☐ approved
		Appr.date	
		Ref. No.	
☒	During the verification of the current MP no need for a PCfrMP, PCfMM or PCfSB has been identified. The monitoring plan is in accordance with the approved methodology applied by the PA		
☐	An approval of the following PCfrMP, PCfMM or PCfSB is to be requested from the EB for the current MP as appendix 1 of the project standard does not apply.		
1	Issue:		
2	Issue:		
☐	The following PCfrMP, PCfMM or PCfSB for which appendix 1 of the PS is applicable have been applied:		
1	Issue:		
2	Issue:		

E.3.2.6. Changes to the project design

It has been checked whether any changes to the project design (CoPD) have been approved prior or during this monitoring period or submitted with this monitoring report. The result is summarized in the table below.

☒	No CoPD has been submitted to the UNFCCC prior to the current monitoring period		
☐	The following CoPD have been approved or are under approval by the UNFCCC		
☐	1	Title	
		Status	☐ under approval; ☐ approved
		Appr.date	
		Ref. No.	
	2	Title	
		Status	☐ under approval; ☐ approved
		Appr.date	
		Ref.No.	
☒	During the verification of the current MP no need for a CoPD has been identified. The monitoring plan is in accordance with the approved methodology applied by the PA		
☐	An approval of the following CoPD is to be requested from the EB for the current MP as appendix 1 of the project standard does not apply.		
1	Issue:		
2	Issue:		

☐	The following CoPD for which appendix 1 of the PS is applicable have been applied:	
1	Issue:	
2	Issue:	

E.3.2.7. Changes specific to afforestation and reforestation activities

☒	N/A - as this registered PoA is not an afforestation and reforestation activity
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E.3.3. Compliance of the registered monitoring plan with applied methodologies and standardized baselines

Means of verification	By means of comparison of the MR with (i) the applied CDM methodology (ii) all applicable CDM Meth tools and (iii) if applicable, a standardized baseline the verification team has checked whether the MP is in compliance with the MP related requirements of the applied methodology/tools/SB. The following sources of information have been used in this context: • /MR/ • /AMS II. G./ • /unfccc/ • /TOOL30/							
Findings	☒	The MP is completely in accordance with the approved methodology applied by the CDM PoA project (last registered/approved version of the PoA-DD)						
	☐	The breakdown of MP accordance of the referenced guidelines is as follows:						
		1	<table border="1"> <tr> <td>Title (of the guideline)</td> <td>Calculation of the fraction of non-renewable biomass version 2.0</td> </tr> <tr> <td>MP compliance</td> <td> ☐ full compliance ☐ findings have been raised ☒ N/A (for MP) </td> </tr> </table>	Title (of the guideline)	Calculation of the fraction of non-renewable biomass version 2.0	MP compliance	☐ full compliance ☐ findings have been raised ☒ N/A (for MP)	
		Title (of the guideline)	Calculation of the fraction of non-renewable biomass version 2.0					
		MP compliance	☐ full compliance ☐ findings have been raised ☒ N/A (for MP)					
	2	<table border="1"> <tr> <td>Title (of the tool)</td> <td></td> </tr> <tr> <td>Version</td> <td></td> </tr> <tr> <td>MP compliance</td> <td> ☐ full compliance ☐ findings have been raised ☒ N/A </td> </tr> </table>	Title (of the tool)		Version		MP compliance	☐ full compliance ☐ findings have been raised ☒ N/A
	Title (of the tool)							
	Version							
	MP compliance	☐ full compliance ☐ findings have been raised ☒ N/A						
☐	The breakdown of MP accordance of the applicable SB is as follows:							
	1	<table border="1"> <tr> <td>Title (of the SB)</td> <td>Name of SB</td> </tr> <tr> <td>Version</td> <td></td> </tr> <tr> <td>MP compliance</td> <td></td> </tr> </table>	Title (of the SB)	Name of SB	Version		MP compliance	
	Title (of the SB)	Name of SB						
Version								
MP compliance								
☐	In this context the following CARs, CLs, FARs have been raised:							
Conclusion	☒	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.						
	☐	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.						
	-							

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	By means of comparison of the MR and the ER calculation with the latest version of the registered PoA-DD/CPA-DDs, the verification team has checked whether all parameters fixed ex-ante or at renewal of the crediting period have been applied correctly. Parameters which are fixed ex-ante are listed as below have been found to be adequately provided in the section E.1 of the MR. Corresponding values in the ER sheet are also verified to be correct. 1. Q_{biomass} 2. $f_{\text{NRB},y}$ 3. NCV_{biomass} 4. $EF_{\text{projected_fossilfuel}}$ 5. η_{old} 6. LAF The following sources of information have been used in this context: • /MR/ • /XLS/ • /PoA-DD/ • /CPA-DD/ • /PS/ • /VVS/ • /unfccc/ • /AMS II. G/ • /TOOL30/	
Findings	☒	The MR and the ER calculation have considered the parameters fixed ex-ante or at the renewal of the crediting period correctly, no deviations have been observed.
	☐	The following deviations from the parameters fixed ex-ante or at renewal of crediting period have been identified in the course of this verification: - N/A
	☐	In this context the following CARs, CLs, FARs have been raised: - For details please refer to appendix 4
Conclusion	☒	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.
	☐	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out.
	The fixed ex-ante parameters corresponding with the provisions of CPA-DD are appropriately applied for the ER calculation.	

E.3.4.2. Data and parameters monitored

Means of verification	During the verification all relevant monitoring parameters (as listed in the PoA-DD) have been verified with regard to the (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. The results as well as the verification procedure are described parameter-wise in the project specific verification checklist (Appendix 5).	
Findings	CL 01 and CAR 03	
Conclusion	☐	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.
	☒	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
	During the verification all relevant monitoring parameters (as listed in chapter D.7.1 of the registered CPA-DD) have been verified with regard to the appropriateness	

	of the applied measurement / determination method, the correctness of the values applied for ER calculation, the accuracy, and applied QA/QC measures. The results as well as the verification procedure are described parameter-wise in the project specific verification checklist (Appendix 5). After appropriate corrections were carried out by the project participant it can be confirmed that all monitoring parameters have been measured / determined without material misstatements and in line with all applicable standards and relevant requirements.
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E.3.4.3. Implementation of sampling plan

Means of verification	The verification team checked whether the PP applied a sampling approach to determine the monitored values. Further it has been checked whether the PP correctly applied the implemented sampling plan including (i) description of the implemented sampling design (ii) collected data (iii) analysis of collected data (iv) demonstration on whether the required confidence/precision has been met. The following sources of information have been used in this context: • /MR/ • /RC/ • /XLS/ • /WBT/ • /PoA-DD/ • /CPA-DD/		
Findings	☐	The PPs have not applied sampling approaches for the parameters monitored.	
	☒	The PPs have applied sampling approaches for the following parameters monitored.	
		Name:	N_{all} - Total number of stoves installed
		Description on how the sampling efforts and survey comply with the validated sampling plan:	The CPA implementer is maintaining a database of all the ICSs installed under the CPAs. At the point of <i>Bodhu Chulha</i> installation, the presence of existing <i>Bondhu Chulha</i>, if any, is also checked in the ICS installation database during the remote assessment. Subsequent (secondary) <i>Bondhu Chulha</i>, if any, is not included in the CPAs. A review of the total installation database and review of end user details (name, address, location) confirms that absence of other project ICS is ensured at the time of installation and only one ICS is installed per household. Monitoring surveys and WBTs were conducted in MS#1 (Surveys and Water Boiling Tests) during 14-01-2018 to 05-02-2018, in MS#2 (Surveys and Water Boiling Tests) during 14-01-2019 to 12-02-2019 and in MS#3 (Surveys and Water Boiling Tests) during 14-01-2020 to 16-02-2020. The Verification Team ascertained the implementation and the appropriateness of the total stove installation database and found that the monitored samples could be traced to the ICS installation database as well as were reachable in the field, during the remote audit. Please refer below assessment regarding sampling outcomes.
	Name:	SOF - ICS Operation Fraction - To determine only ICS that are still operating, measured ex-post through survey/ user feedback	
Description on how the sampling efforts and survey comply	The SOF was determined for MS1, MS2 and MS3 separately for each category type (Domestic and Non-Domestic) A monitoring survey was conducted in MS#1 (Surveys and Water Boiling Tests) during 14-01-2018 to 05-02-2018, in MS#2 (Surveys and Water Boiling Tests) during 14-01-2019 to 12-02-2019 and in MS#3 (Surveys and Water Boiling Tests) during 14-01-2020 to 16-		

with the
validated
sampling
plan:

02-2020.

The required sample sizes for proportion-based parameter (SOF) has been derived using equation (1) & (2) of Appendix 2 of the Guideline: Sampling and surveys for CDM project activities and programmes of activities, Version 04.0 as follows:

$$n \geq \frac{z^2 * N * V}{(N-1) * precision^2 + z^2 * V}$$

Where,

n = number of ICS to be sampled

N = Total number of ICS in the population / sampling frame

z = Constant referring to level of confidence (e.g. 1.645 for 90 %; 1.96 for 95 % confidence)

Precision = Required precision (e.g. 10% = 0.1)

$$V = \frac{p(1-p)}{p^2}$$

Where,

p = expected proportion of the population / sampling frame.

The sample size was calculated based on estimated proportion values based on project developer's knowledge and experience in line with para 13(b) and 13(c) of the Sampling and surveys for CDM project activities and programmes of activities. The total number of samples are in line with Standard: Sampling and surveys for CDM project activities and programme of activities, were identified by PP. Subsequently, all ICS users' samples identified were surveyed ^{/SUR/} as illustrated below:

Parameter	Sampling approach	Sampling Type	Population		Sample Size	
			Domestic			
SOF	SiRS	PS	Strata	Population	Sample required	Samples covered
			MS#1	433,052	43	53
			MS#2	433,052	55	63
			MS#3	433,052	68	71
SOF	SiRS	PS	Non-Domestic			
			MS#1	4,164	30	36
			MS#2	4,164	32	36
			MS#3	4,164	43	45

Procedures for sampling have been duly articulated in the field monitoring survey spreadsheet and corresponding survey forms containing survey records were furnished to DOE for assessment.

However, findings were raised on this during the verification process and CME has sufficiently taken the appropriate action and hence all findings could be resolved.

For more detail, Appendix-4 of this report can be referred.

Parameter

η_{new} - Efficiency of the system being deployed as part of the project activity

Name:

Efficiency of the system being deployed as part of the project activity

Description on how the sampling efforts and survey comply with the validated sampling plan:

The efficiency was determined for MS1, MS2 and MS3 separately for each category type (Domestic and Non-Domestic)

The sample size has been calculated according to the following equations:

- The required sample size for mean based parameter (η_{new}) has been derived using equation (4), (5) & (6) of Appendix 2 of the Guideline: Sampling and surveys for CDM project activities and programmes of activities, Version 04.0 as follows:

$$n \geq \frac{z^2 * N * V}{(N-1) * precision^2 + z^2 * V}$$

Where,

n = number of ICS to be sampled
 N = Total number of ICS in the population/sampling frame
 z = Constant referring to level of confidence (e.g. 1.645 for 90 %; 1.96 for 95 % confidence)
 Precision = Required precision (e.g. 10% = 0.1)

$$V = \left(\frac{SD}{Mean} \right)^2$$

Where

SD = expected standard deviation of the population / sampling frame

Mean = expected mean of the population / sampling frame

A sample size was calculated based on estimated proportion values based on project developer's knowledge and experience in line with para 13(b) and 13(c) of the Sampling and surveys for CDM project activities and programmes of activities.

Parameter	Sampling approach	Sampling Type	Population		Sample Size	
η _{new}	SiRS	PS	Strata	Population	Sample required	Samples covered
			Domestic			
			MS#1	433,052	7	9
			MS#2	433,052	7	8
η _{new}	SiRS	PS	Non-Domestic			
			MS#1	4,164	7	7
			MS#2	4,164	7	7
			MS#3	4,164	7	7

Procedures for sampling have been duly articulated in the field monitoring survey spreadsheet and corresponding survey forms containing survey questionnaires furnished to DOE for assessment.

Monitoring WBTs were conducted by trained personnel using simple random sampling following the standard and guideline for Sampling and surveys for CDM project activities and programme of activities version 08. As described above, it can be said that sampling was accurate. However, findings were raised on this during the verification process and CME has sufficiently taken the appropriate action and hence all findings could be resolved.

For more detail, Appendix-4 of this report can be referred.



In this context the following CARs, CLs, FARs have been raised:

CL 01, CAR 01, CAR 02, CAR 04

Conclusion



No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.



The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.

Based on the assessment of survey and sampling records including WBT and their analysis sheets for the related parameters, it is concluded that all the parameters have been monitored correctly in accordance with registered monitoring plan and the applied methodology.

The verification team concludes that all sampled parameters have been calculated correctly in line with the registered corresponding CPA-DDs and the sampling standard. For all the parameters, the achieved relative precision of 10% and 95% confidence level is demonstrated to be met.

Based on above along with the remote assessment of the project stoves installation in Bangladesh, the verification team concludes the approach and result deemed appropriate and acceptable.

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

Means of verification	During the verification, the relevant monitoring equipment has been checked whether the calibration requirements have been met; especially if the calibration frequency is in line with the requirements of the validated CPA-DD and/or the applicable calibration standards. The results as well as the verification procedure are described equipment-wise in the project specific verification checklist (Appendix 6). The following sources of information have been used in this context: • /MR/ • /XLS/ • /CAL/ • /PoA-DD/ • /CPA-DD/						
Findings	<table border="1"> <tr> <td data-bbox="448 651 502 831">☒</td><td data-bbox="502 651 1436 831">Calibration is not under the purview of the CME, however, third party WBT agency has provided the complete calibration detail of the equipment in the report which were also checked during remote assessment by the verification team and found to be appropriate. Thus, the verification team can confirm that all installed monitoring equipment has been duly calibrated for this entire monitoring period.</td></tr> <tr> <td data-bbox="448 831 502 1111">☐</td><td data-bbox="502 831 1436 1111">Based on the assessment and information as per appendix 6 delay(s) in calibration have been identified. The PP has applied the maximum permissible error of the instrument to the measured values taken during the period between the scheduled date of calibration and the actual date of calibration. From the related calibration certificates and emission reduction calculation the verification team confirms that the maximum permissible error has been applied in a conservative manner so that the adjusted measured values due to the delayed calibration result in fewer claimed emission reductions. For details please refer to appendix 6</td></tr> <tr> <td data-bbox="448 1111 502 1167">☐</td><td data-bbox="502 1111 1436 1167">In this context the following CARs, CLs, FARs have been raised: -</td></tr> </table>	☒	Calibration is not under the purview of the CME, however, third party WBT agency has provided the complete calibration detail of the equipment in the report which were also checked during remote assessment by the verification team and found to be appropriate. Thus, the verification team can confirm that all installed monitoring equipment has been duly calibrated for this entire monitoring period.	☐	Based on the assessment and information as per appendix 6 delay(s) in calibration have been identified. The PP has applied the maximum permissible error of the instrument to the measured values taken during the period between the scheduled date of calibration and the actual date of calibration. From the related calibration certificates and emission reduction calculation the verification team confirms that the maximum permissible error has been applied in a conservative manner so that the adjusted measured values due to the delayed calibration result in fewer claimed emission reductions. For details please refer to appendix 6	☐	In this context the following CARs, CLs, FARs have been raised: -
☒	Calibration is not under the purview of the CME, however, third party WBT agency has provided the complete calibration detail of the equipment in the report which were also checked during remote assessment by the verification team and found to be appropriate. Thus, the verification team can confirm that all installed monitoring equipment has been duly calibrated for this entire monitoring period.						
☐	Based on the assessment and information as per appendix 6 delay(s) in calibration have been identified. The PP has applied the maximum permissible error of the instrument to the measured values taken during the period between the scheduled date of calibration and the actual date of calibration. From the related calibration certificates and emission reduction calculation the verification team confirms that the maximum permissible error has been applied in a conservative manner so that the adjusted measured values due to the delayed calibration result in fewer claimed emission reductions. For details please refer to appendix 6						
☐	In this context the following CARs, CLs, FARs have been raised: -						
Conclusion	<table border="1"> <tr> <td data-bbox="448 1173 502 1240">☒</td><td data-bbox="502 1173 1436 1240">No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.</td></tr> <tr> <td data-bbox="448 1240 502 1330">☐</td><td data-bbox="502 1240 1436 1330">The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.</td></tr> </table> Though the applied methodology and registered PoA monitoring plan do not make provision for calibration, however, it was checked during the verification and interview with Water Boiling testing team that all the equipment used for WBT were duly calibrated (during the yearly test conducted) or were newly purchased. All the relevant equipment including thermometer, moisture meters, weighing scale were duly purchased (purchase receipt dated 28/12/2017, 08/10/2018 and 08/09/2019 for MS#1, MS#2 and MS#3 respectively). SZCSL has submitted all purchase receipts during the remote verification audit for all the relevant equipment^{/CAL/} used for conducting WBTs. During document review and remote assessment (video call), these equipment were assessed and found to be working properly and accurately. WBTs conducted were also verified to be in line with WBT protocol requirement.	☒	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.	☐	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.		
☒	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.						
☐	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.						

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	During the verification the calculation of baseline GHG emissions has been checked. In detail the following has been verified: • <i>Transparency:</i> It has been checked whether the calculation of baseline emissions is fully traceable and, where used, the Excel calculation provides all calculation formulae.
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- *Parameter consistency:* It has been checked whether all internal and external parameters and data used for the calculation are applied consistently in the monitoring report and the calculation spreadsheet.
- *Correctness:* It has been checked whether the applied formulae and methods for calculating baseline emissions are in accordance with the monitoring plan and the approved methodology.
- *Completeness:* It has been checked whether all calculations are complete and without omissions.

$$B_{old} = LAF * N_{all} * SOF * Q_{biomass} * Stove_{year}$$

Where,

$Stove_{year}$

Calculated average ICS operation years in the monitoring period (years)

LAF

Net to gross Adjustment factor (0.95) applied in accordance with paragraph 13 and 23 of AMS-II. G version 03

The quantity of woody biomass i.e. saved due to the project activity is calculated as follows: -

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

Where,

B_{old}

Quantity of woody biomass used in the absence of project activity (tonnes)

N

Total number of systems (number)

$Q_{biomass}$

Average annual biomass consumption per appliance (tonnes/year)

$$N = N_{all} * SOF$$

Where,

N_{all}

Total number of ICS installed

SOF

ICS Operation Fraction (% of ICS operating or replaced by equivalent in-service appliance) – measured ex post using survey/ user feedback

No sample was found using baseline stove along with project ICS hence correction of B_{old} is not deemed applicable^{/ER/SURVEY/}.

The calculation of baseline emission reduction and emission reduction is further addressed under section E.3.6.4 of this report below.

The following sources of information have been used in this context:

- /MR/
- /PoA-DD/
- /CPA-DD/
- /XLS/
- /USAGE/
- /WBT/

Findings



The calculation of the baseline emissions was found to be fully compliant with the above stated principles.

The calculations of baseline GHG emissions or baseline net GHG removals have been carried out in accordance with the formulae and methods described in the registered monitoring plan, the applied methodology and, where applicable, the applied standardized baseline. Any assumptions used in emission or removal calculations have been justified. Appropriate emission factors, IPCC default values other reference values have been correctly applied.

		No errors, miscalculations, omissions, misstatements or incomplete information has been identified.
	☐	The verification team has identified mistakes in the baseline emissions calculation or the underlying calculation approaches.
	☐	In this context the following CARs, CLs, FARs have been raised: -
Conclusion	☒	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.
	☐	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 5.
	Based on above and verification of all input values (fixed ex-ante), it can be concluded by verification team that, baseline GHG emissions calculation presented in the MR and corresponding ER sheet is deemed as appropriate.	

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

Means of verification	During the verification the calculation of project GHG emissions has been checked. In detail the following has been verified: <i>Transparency:</i> It has been checked whether the calculation of project emissions is fully traceable and, where used, the Excel calculation provides all calculation formulae. <i>Parameter consistency:</i> It has been checked whether all internal and external parameters and data used for the calculation are applied consistently in the monitoring report and the calculation spreadsheet. <i>Correctness:</i> It has been checked whether the applied formulae and methods for calculating project emissions are in accordance with the monitoring plan and the approved methodology. <i>Completeness:</i> It has been checked whether all calculations are complete and without omissions. The following sources of information have been used in this context: /MR/ /PoA-DD/ /CPA-DD/ /XLS/.	
Findings	☐	The calculation of the project emissions was found to be fully compliant with the above stated principles. The calculations of project GHG emissions or actual net GHG removals have been carried out in accordance with the formulae and methods described in the registered monitoring plan, the applied methodology and, where applicable, the applied standardized baseline. Any assumptions used in emission or removal calculations have been justified. Appropriate emission factors, IPCC default values and other reference values have been correctly applied. No errors, miscalculations, omissions, misstatements or incomplete information have been identified.
	☐	The verification team has identified mistakes in the project emissions calculation or the underlying calculation approaches.
	☐	In this context the following CARs, CLs, FARs have been raised: -
Conclusion	☒	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.
	☐	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
	Project emissions are not applicable by the applied methodology for the registered PoA	

E.3.6.3. Calculation of leakage GHG emissions

Means of verification	During the verification the calculation of leakage has been checked. In detail the following has been verified: • <i>Transparency</i>: It has been checked whether the calculation of leakage is fully traceable and, where used, the Excel calculation provides all calculation formulae. • <i>Parameter consistency</i>: It has been checked whether all internal and external parameters and data used for the calculation are applied consistently in the monitoring report and the calculation spreadsheet. • <i>Correctness</i>: It has been checked whether the applied formulae and methods for calculating project emissions are in accordance with the monitoring plan and the approved methodology. • <i>Completeness</i>: It has been checked whether all calculations are complete and without omissions. Leakage is to be considered by the methodology for non-renewable woody biomass. This can be done either via survey or by applying a default factor of 0.95 to the parameter B_{old}. As per PoA-DD as well as generic and specific CPA-DD, the PP has applied the default net to gross leakage adjustment factor to the parameter B_{old}. Besides, leakage is to be considered in case equipment is transferred from outside the boundary to the project activity. No equipment transfer is involved in the PoA. The baseline systems are destroyed at the time of ICS installation. The following sources of information have been used in this context: • /MR/ • /CPA-DD/ • /XLS/ • /AMS II.G./						
Findings	<table border="1"> <tr> <td data-bbox="451 1064 523 1366">☒</td><td data-bbox="523 1064 1444 1366"> The calculation of the leakage was found to be fully compliant with the above stated principles. The calculations of leakage GHG emissions or actual net GHG removals have been carried out in accordance with the formulae and methods described in the registered monitoring plan, the applied methodology. Any assumptions used in emission or removal calculations have been justified. Appropriate emission factors, IPCC default values and other reference values have been correctly applied. No errors, miscalculations, omissions, misstatements or incomplete information have been identified. </td></tr> <tr> <td data-bbox="451 1366 523 1433">☐</td><td data-bbox="523 1366 1444 1433"> The verification team has identified mistakes in the project emissions calculation or the underlying calculation approaches. </td></tr> <tr> <td data-bbox="451 1433 523 1500">☐</td><td data-bbox="523 1433 1444 1500"> In this context the following CARs, CLs, FARs have been raised: - </td></tr> </table>	☒	The calculation of the leakage was found to be fully compliant with the above stated principles. The calculations of leakage GHG emissions or actual net GHG removals have been carried out in accordance with the formulae and methods described in the registered monitoring plan, the applied methodology. Any assumptions used in emission or removal calculations have been justified. Appropriate emission factors, IPCC default values and other reference values have been correctly applied. No errors, miscalculations, omissions, misstatements or incomplete information have been identified.	☐	The verification team has identified mistakes in the project emissions calculation or the underlying calculation approaches.	☐	In this context the following CARs, CLs, FARs have been raised: -
☒	The calculation of the leakage was found to be fully compliant with the above stated principles. The calculations of leakage GHG emissions or actual net GHG removals have been carried out in accordance with the formulae and methods described in the registered monitoring plan, the applied methodology. Any assumptions used in emission or removal calculations have been justified. Appropriate emission factors, IPCC default values and other reference values have been correctly applied. No errors, miscalculations, omissions, misstatements or incomplete information have been identified.						
☐	The verification team has identified mistakes in the project emissions calculation or the underlying calculation approaches.						
☐	In this context the following CARs, CLs, FARs have been raised: -						
Conclusion	<table border="1"> <tr> <td data-bbox="451 1500 523 1568">☒</td><td data-bbox="523 1500 1444 1568"> No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements. </td></tr> <tr> <td data-bbox="451 1568 523 1657">☐</td><td data-bbox="523 1568 1444 1657"> The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4. </td></tr> </table> PP has applied related default factor (LAF) correctly to the parameter B_{old}. Therefore, no further leakage emission result is separately indicated in monitoring report or this report. Besides, DOE could not identify that any equipment is transferred from outside the boundary to the project activity, based on interviews taken and households remotely verified as well as check of PoA set-up and organisation. ICS are newly produced before distribution and baseline systems are destroyed at the time of ICS installation. Also, no system was found using baseline stove during the audit.	☒	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.	☐	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.		
☒	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.						
☐	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.						

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

Means of verification	The verification team has checked if the MR includes a summary table of the emission reductions calculation specifying separately.
------------------------------	---

- Total baseline emissions,
- Total project emissions,
- Total leakage,
- Total emission reductions.

The MR demonstrate the summary of GHG emission reductions for the monitoring period and calculated according to the applied methodology AMS-II.G. as follows:

$$ER_y = B_{y,savings} * f_{NRB,y} * NCV_{biomass} * EF_{projected_fossilfuel}$$

For MS1 (for illustration purposes only):

CPA 12,

$$B_{y,savings} = 38473.9 * 1 * 0.015 * 81.6 = 47091 \text{ tCO}_2\text{e}^6$$

Where:

ER_y	Emission reductions during the year y in tCO ₂ e
$B_{y,savings}$	Quantity of biomass that is saved in tonnes
$f_{NRB,y}$	Fraction of biomass saved by the project activity in year y that can be established as non-renewable biomass using survey methods
$NCV_{biomass}$	Net calorific value of the non-renewable biomass that is substituted (IPCC default for wood fuel, 0.015 TJ/tonne)
$EF_{projected_fossilfuel}$	Emission factor for the substitution of non-renewable biomass by similar consumers. Use a value of 81.6 tCO ₂ / TJ

It has been assessed whether the values are correct or need to be revised as a consequence of issues identified during the desktop reviews and remote assessments. Findings have been raised and all monitored parameters have been duly verified.

The following sources of information have been used in this context:

- /MR/
- /XLS/
- /CPA-DD/
- /PoA-DD/
- /AMS II.G/
- /USAGE/
- /WBT/

Findings	☒	Section F.4 of the MR includes in a summary table of the emission reductions calculation.
	☐	The summary table specified the total baseline, project and leakage emissions as well as the total emission reductions separately.
	☐	The values as specified in the ER summary table are correct; no issues have been identified during the verification which requires changes in the ER calculation.
	☒	During the verification issues with impact on the ER calculation have been identified.
Conclusion		CAR 02 and CAR 03
	☐	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.
	☒	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
		The summary table in MR has been filled correctly and the values are in line with related emission reduction calculation spreadsheet.

⁶Refer tab "ER calculations"

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
Improved Cooking Stoves in Bangladesh – CPA No.12 “SZ Consultancy Services Ltd.” Ref: 4791-P1-0012-CP1	137,966	0	0	0	137,966	137,966
Improved Cooking Stoves in Bangladesh – CPA No.13 “SZ Consultancy Services Ltd.” Ref: 4791-P1-0013-CP1	136,439	0	0	0	136,439	136,439
Improved Cooking Stoves in Bangladesh – CPA No.14 “SZ Consultancy Services Ltd.” Ref: 4791-P1-0014-CP1	136,879	0	0	0	136,879	136,879
Improved Cooking Stoves in Bangladesh – CPA No.15 “SZ Consultancy Services Ltd.” Ref: 4791-P1-0015-CP1	136,311	0	0	0	136,311	136,311
Improved Cooking Stoves in Bangladesh – CPA No.16 “SZ Consultancy Services Ltd.” Ref: 4791-P1-0016-CP1	138,298	0	0	0	138,298	138,298
Improved Cooking Stoves in Bangladesh – CPA No.17 “SZ Consultancy Services Ltd.” Ref: 4791-P1-0017-CP1	137,518	0	0	0	137,518	137,518
Improved Cooking Stoves in Bangladesh – CPA No.18 “SZ Consultancy Services Ltd.” Ref: 4791-P1-0018-CP1	137,802	0	0	0	137,802	137,802
Improved Cooking Stoves in Bangladesh – CPA No.19 “SZ Consultancy Services Ltd.” Ref: 4791-P1-0019-CP1	125,623	0	0	0	125,623	125,623
Total	1,086,836	0	0	0	1,086,836	1,086,836

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

Means of verification	The verification team has checked if the MR includes a comparison of actual values of the monitoring period with the estimations in the included CPA-DD. It has further checked which of the below listed cases is applicable for the calculated ER of the current monitoring period.
------------------------------	---

Findings	☒	Case 1: The ex-ante estimated value was found to be proportionally higher than the ex-post determined value. No further action is deemed required.
	☐	Case 2: The ex-ante estimated value fits very good to the actually monitored value. No further justification is deemed required.
	☐	Case 3: The ex-ante estimated value was found to be proportionally lower than the ex-post determined value.
	☐	In this context the following CARs, CLs, FARs have been raised: -
Conclusion	☒	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.
	☐	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
	-	-

Title and UNFCCC reference number of the CPA	Actual values achieved by the CPAs during this monitoring period (tCO ₂)	Value estimated in ex ante calculation in the included CPA-DD(s) (tCO ₂)
Improved Cooking Stoves in Bangladesh – CPA No.12 “SZ Consultancy Services Ltd.” Ref: 4791-P1-0012-CP1	137,966	148,662 ⁷
Improved Cooking Stoves in Bangladesh – CPA No.13 “SZ Consultancy Services Ltd.” Ref: 4791-P1-0013-CP1	136,439	147,816
Improved Cooking Stoves in Bangladesh – CPA No.14 “SZ Consultancy Services Ltd.” Ref: 4791-P1-0014-CP1	136,879	148,812
Improved Cooking Stoves in Bangladesh – CPA No.15 “SZ Consultancy Services Ltd.” Ref: 4791-P1-0015-CP1	136,311	148,713
Improved Cooking Stoves in Bangladesh – CPA No.16 “SZ Consultancy Services Ltd.” Ref: 4791-P1-0016-CP1	138,298	150,564
Improved Cooking Stoves in Bangladesh – CPA No.17 “SZ Consultancy Services Ltd.” Ref: 4791-P1-0017-CP1	137,518	150,321
Improved Cooking Stoves in Bangladesh – CPA No.18 “SZ Consultancy Services Ltd.” Ref: 4791-P1-0018-CP1	137,802	150,393

⁷ For 4791-P1-0012-CP1

= Ex-ante ER as per CPA-DD per year * duration of monitoring period / days in a year

= 49,544 * 1095 / 365 (Number of monitoring days in the monitoring period = (365*3) = 1095 as there are three annual monitoring session in the monitoring period)

= 148,662 tCO_{2e}

Improved Cooking Stoves in Bangladesh – CPA No.19 “SZ Consultancy Services Ltd.” Ref: 4791-P1-0019-CP1	125,623	137,067
Total	1,086,836	1,182,348

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

Means of verification	On the basis of the above comparison of actual values of the monitoring period with the estimations in the registered PoA-DD (E.8.5) and section F.5 of the MR, the verification team has checked whether (in case 3) an appropriate explanation is included in the MR.	
Findings	☒	No further justification or explanation is deemed required as actual emissions of this MP do not exceed significantly the ex-ante calculated emission reductions (applicable for case 1 and 2).
	☐	For case 3: The PP has provided a related justification in the MR. The reasons for the increase are as follows: - N/A
	☐	In this context the following CARs, CLs, FARs have been raised: -
Conclusion	☒	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.
	☐	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
	-	-

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

Means of verification	☒	N/A – as the PP has not monitored the sustainable development co-benefits of the registered CDM project activity or not requested the DOE to verify them.
	☐	The project participants have monitored the sustainable development co-benefits of the registered CDM project activity and requested the DOE to verify them. The following sources of information have been used in this context: • /MR/ • /PoA-DD/ • /CPA-DD/ • /unfccc/.
Findings	☒	N/A – as the PP has not monitored the sustainable development co-benefits of the registered CDM project activity or not requested the DOE to verify them.
	☐	Therefore, the DOE has assessed and confirms that: (a) The monitoring has been carried out in accordance with the document for monitoring sustainable development co-benefits, if such document was developed and published on the UNFCCC CDM website in accordance with the “CDM project standard for project activities”; (b) The reported monitoring results correspond to the sustainable development co-benefits of the project activity as observed by the DOE.
	☐	In this context the following CARs, CLs, FARs have been raised: -
Conclusion	☒	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.
	☐	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
	☒	N/A – as the PP has not monitored the sustainable development co-benefits of the registered CDM project activity or not requested the DOE to verify them.
	-	-

E.3.8. Global stakeholder consultation

Means of verification	In accordance with the PCP the DOE has submitted the initial version of the monitoring report provided by the PP for this monitoring period to be published on the UNFCCC webpage. The monitoring report has been published for the period from 18/05/2020. The following sources of information have been used in this context: • /MR/ • /unfccc/.
Findings	☒ No comments have been received on the published monitoring report for this monitoring period.
	☐ Comments have been received and the DOE has concluded that comments are related to issues outside the CDM rules and requirements. Please refer to the list provided under Conclusion of this Section below for related information.
	☐ Comments have been received. The DOE has - requested further information from the submitters of the comments - informed the project participants of the comments received, and requested their feedback within a specified timeframe, - considered the input received and has assessed whether such comments are relevant to the CDM project activity, - acknowledged receipt of all submitted comments on the MR of the proposed CDM project activity, - assessed whether the comments are related to the CDM rules and requirements (if so related findings have been raised as per below), - used all possible means to determine the authenticity of the name and contact details of the individual or organization on whose behalf the comments have been submitted, - contacted the secretariat to make them publicly available (if only addressed to the DOE), - determined whether authentic and relevant comments in the global stakeholder consultation were taken into due account in the PDD of the proposed CDM project activity.
	☐ In this context the following CARs, CLs, FARs have been raised, i.e. as the DOE concludes that the comments are related to the CDM rules and requirements:
Conclusion	☒ No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.
	☐ The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
	☒ No comments received during the stakeholder consultation process.

SECTION F. Internal quality control

Before the submission of the final verification report a technical review of the whole verification procedure was carried out. The technical reviewers are competent GHG auditors where at least one is being appointed for the scope this project falls under. The technical reviewers are not considered to be part of the verification team and thus not involved in the decision-making process up to the technical review.

As a result of the technical review process the verification opinion and the topic specific assessments as prepared by the verification team leader may have been confirmed or revised. Furthermore, reporting improvements might have been achieved.

After the successful technical review an overall (esp. procedural) assessment of the complete verification has been carried out by a senior assessor located in the accredited premises of TÜV NORD.

After this step the submission for requesting for issuance is conducted.

SECTION G. Verification opinion

Grameen Shakti (GS) has commissioned the TÜV NORD JI/CDM Certification Program to carry out the 3rd periodic verification of the CDM PoA: **“Improved Cooking Stoves in Bangladesh”**, with regard to the relevant requirements for CDM Programme of Activities. The PoA reduces GHG emissions due to dissemination of fuel-efficient wood stoves compared to the baseline scenario.

This verification covers the period from 13/01/2017 – 12/01/2020 (both days inclusive).

The programme of activities reduces GHG emissions by disseminating biomass based improved cookstoves (Domestic/ Non-Domestic) in Bangladesh. The CPAs under consideration (CPA 4791-P1-0012-CP1 to CPA 4791-P1-0019-CP1) reduce GHG by disseminating biomass based improved cookstoves in Bangladesh.

As a result of this verification, the verifier confirms that:

- all operations of the project are implemented and installed as planned and described in the validated project design documents,
- the monitoring plan is in accordance with the applied approved CDM methodology, i.e., AMS II.G. Version 03.0,
- the installed equipment essential for measuring parameters required for calculating emission reductions are calibrated appropriately,
- the monitoring system is in place and functional. The project has generated GHG emission reductions,
- the GHG emission reductions are calculated without material misstatements in a conservative and appropriate manner.

TÜV NORD JI/CDM CP further confirms that the project has achieved emission reductions in the above-mentioned reporting period as follows:

Emission reductions: **1,086,836 tCO₂e**

SECTION H. Certification statement

As a duly accredited DOE, TÜV NORD CERT confirms that the CDM PoA

“Improved Cooking Stoves in Bangladesh”

registered under

UNFCCC-No.:4791

has achieved emission reductions in accordance with all applicable requirements for registered CDM project activities during the current monitoring period

MP-No.: 3

from: 13/01/2017

to: 12/01/2020

(including both days) as follows:

Emission reductions: **1,086,836 tCO₂e**

New Delhi, 20/11/2020



Prakash Kumar Mishra
Team Leader
TÜV NORD JI/CDM Certification Program

Appendix 1. Abbreviations

Abbreviations	Full texts
CA	Corrective Action / Clarification Action
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CER	Certified Emission Reduction
CME	Coordinating/Managing Entity
CO ₂	Carbon dioxide
CO _{2eq}	Carbon dioxide equivalent
CL	Clarification Request
DOE	Designated Operational Entity
DVerR	Draft Verification Report
GS	Grameen Shakti
ER	Emission Reduction
FAR	Forward Action Request
FMR	Field Monitoring Records
GHG	Greenhouse gas(es)
ICS	Improved Cookstove
IM	Interview Memo
IRC	Information & Reporting Check by UNFCCC Secretariat
MP	Monitoring Plan
MR	Monitoring Report
PA	Project Activity
POA-DD	Project of Activities Design Document
CPA-DD	Component Project Activities Design Document
PP	Project Participant
QA/QC	Quality Assurance / Quality Control
RC	Reliability check work sheets for WBT and field monitoring test
SD	Standard deviation
SZCSL	SZ Consultancy Services Ltd.
UNFCCC	United Nations Framework Convention on Climate Change
VT	Verification Team
VVS	Validation and Verification Standard
WBT	Water Boiling Test
WBTP	Water Boiling Test Protocol
XLS	Emission Reduction Calculation Spread Sheet

Appendix 2. Competence of team members and technical reviewers



Statement of Competence
Appointment and authorization according to the procedures
of the TUV NORD JRCOM Certification Program

Mr. Prakash Kumar Mishra

SCHEME	STATUS	VALID UNTIL
CDM	Senior Assessor (Validation, Verification) Technical Reviewer	2025-12-17
VCS / ISO 14064-2	Senior Assessor Technical Reviewer	2025-12-17

Authorization status for technical areas within sectoral scopes:

CODE	TECHNICAL AREA
1.2	Renewables
3.1	Energy demand

146 - Rev. 6, Date: 2018-11-21

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Appendix 3. Documents reviewed or referenced

No.	Author	Reference	Title	References to the document	Provider
1	UNFCCC	/AMS-II-G/	AMS-II.G: Energy efficiency measures in thermal applications of non-renewable biomass", version 03.0	https://cdm.unfccc.int/methologies/D/B/ZI2M2X5P7ZLRGFO37YBVDYOW62UHQP	Other
2	PP	/CAL/ /INV/	Thermometers, weighing scales, sensor, moisture meters photos and purchase invoice dated 28/12/2017, 08/10/2018 and 08/09/2019 for MS1, MS2, MS3 respectively.		Other
3	PP	/CPA-DD/	CPA-DD titled `Improved Cooking Stoves in Bangladesh- CPA 0012, version 2.2, dated 08/01/2016 CPA-DD titled `Improved Cooking Stoves in Bangladesh- CPA 0013, version 2.2, dated 08/01/2016 CPA-DD titled `Improved Cooking Stoves in Bangladesh- CPA 0014, version 2.2, dated 08/01/2016 CPA-DD titled `Improved Cooking Stoves in Bangladesh- CPA 0015, version 2.2, dated 08/01/2016 CPA-DD titled `Improved Cooking Stoves in Bangladesh- CPA 0016, version 2.2, dated 08/01/2016 CPA-DD titled `Improved Cooking Stoves in Bangladesh- CPA 0017, version 2.2, dated 08/01/2016 CPA-DD titled `Improved Cooking Stoves in Bangladesh- CPA 0018, version 2.2, dated 08/01/2016 CPA-DD titled `Improved Cooking Stoves in Bangladesh- CPA 0019, version 2.2, dated 08/01/2016	https://cdm.unfccc.int/ProgrammeOfActivities/poa_d/b/SE7XIMKF8NYVOTL16BW3U45C9ZDGAP/view	Other
4	DOE	/CPM/	TÜV NORD JI / CDM CP Manual (incl. CP procedures and forms)		Other
5	IPCC	/IPCC/	1996 IPCC Guidelines for National Greenhouse Gas Inventories: work book 2006 IPCC Guidelines for National Greenhouse Gas Inventories: work book	www.ipcc-nggip.iges.or.jp	Other
6	UNFCCC	/KPI/	Kyoto Protocol (1997)	http://unfccc.int/kyoto_protocol/it/ems/2830.php	Other

7	UNFCCC	/MA/	Decision 3/CMP. 1 (Marrakesh – Accords)	http://cdm.unfccc.int/Reference/COPMOP/index.html	Other
8	UNFCCC	/MR/	Monitoring Report titled ` PoA 4791 - CPA 12-19 MP#3 MR version 2.0 11092020  Monitoring Report titled ` PoA 4791 - CPA 12-19 MP#3 MR version 2.0 28092020	https://cdm.unfccc.int/ProgrammeOfActivities/poadb/SE7XIMKF8NYVOTL16BW3U45C9ZDGAP/view	Other
9	UNFCCC	/MRT/	Monitoring Report Form (CDM-PoA- MR-FORM), Version 03.0	https://cdm.unfccc.int/Reference/PDDs_Forms/index.html	Other
10	UNFCCC	/PoA-DD/	Project Design Document for CDM PoA project: “Improved Cooking Stoves in Bangladesh” version 07.1, dated 28/06/2011		Other
11	UNFCCC	/PS/	CDM Project Standard for PoA (Version 2.0)	http://cdm.unfccc.int/Reference/Standards/index.html	Other
12	PP	/DB/	• Customer Database sheet (PoA 4791 MP#3 Sampling and Installation database) • Contractual agreement in between the CME and the DO (Agreement between CME and SZCSL) • Customer terms & conditions document provided as Proof of Carbon Credits waiver by End user (ERPA Agreement between SZ & VNV) • Sample customer agreement document provided as proof of ICS distribution receipt provided for MS#1, MS#2 and MS#3 • Evidence for random number generator for sampling for MS#1, MS#2 and MS#3 • Contractual agreement in between the CME and the PO (SZ Consultancy Services) dated 08/08/2016 clearly covering scope of engagement (as per requirement of the PoA-DD) • Sample End User Agreement (in local language Bengali) – • 08 for MS1 domestic, • 08 for MS1 non-domestic, • 08 for MS2 domestic, • 09 for MS2 domestic,	-	CME

			• 08 for MS3 domestic, • 08 for MS3 domestic, • Sample customer agreement document provided as proof of ICS distribution receipt • Random number generator for sampling • ERPA showing delivery commitments		
13	PP	/SSQ/	• Sample Monitoring Survey Forms in form of questionnaire • CPA Distribution Records		Other
14	PP	/WBTP/	• The Water Boiling Test protocol, version 4.2.3 • Guidelines for Testing Charcoal Stoves with WBT 4.2.2 June 14, 2013		
15	PP	/RC/	• Reliability Check • Sample size and Reliability check for WBT integrated into the ER worksheet		PP
16	PP	/TRG/	Training records of imparted for below fields: • Partner Training Manual.pdf • Partner Training sample Photographs • Monitoring survey training photographs • Attendance of Monitoring survey training Sheets for the year 2018, 2019 and 2020 • WBT team training records • BBF Experience - Field monitoring and performance testing		Other
17	PP	/VAL/	Validation Report for CPA-DD-19 (Appendix 2 - Inclusion Report) Title-“ Improved Cooking Stoves in Bangladesh – CPA No.19 “SZ Consultancy Services Ltd.”” Version 04, dated 08/01/2016 Validation Report for CPA-DD-18 (Appendix 2 - Inclusion Report) Title-“ Improved Cooking Stoves in Bangladesh – CPA No.18 “SZ Consultancy Services Ltd.”” Version 04, dated 08/01/2016 Validation Report for CPA-DD-17 (Appendix 2 - Inclusion Report) Title-“ Improved Cooking Stoves in Bangladesh – CPA No.17 “SZ Consultancy Services Ltd.”” Version 04, dated 08/01/2016 Validation Report for CPA-DD -16 (Appendix 2 - Inclusion Report) Title-“ Improved Cooking Stoves in Bangladesh – CPA No.16 “SZ Consultancy Services Ltd.”” Version 04, dated 08/01/2016 Validation Report for CPA-DD -15 (Appendix 2 - Inclusion Report) Title-“ Improved Cooking Stoves in Bangladesh – CPA No.15 “SZ Consultancy Services Ltd.”” Version 04, dated 08/01/2016 Validation Report for CPA-DD -14 (Appendix 2 - Inclusion Report) Title-“ Improved Cooking Stoves in Bangladesh – CPA No.14 “SZ Consultancy Services Ltd.”” Version 04, dated 08/01/2016 Validation Report for CPA-DD -13 (Appendix 2 - Inclusion Report) Title-“ Improved Cooking Stoves in Bangladesh – CPA No.13 “SZ Consultancy Services Ltd.”” Version 04,	https://cdm.unfccc.int/ProgrammeOfActivities/po_a_db/SE7XIMKF8NYVOTL16BW3U45C9ZDGAP/view	PP

			dated 08/01/2016 Validation Report for CPA-DD -12 (Appendix 2 - Inclusion Report) Title-“ Improved Cooking Stoves in Bangladesh – CPA No.12 “SZ Consultancy Services Ltd.”” Version 04, dated 08/01/2016		
18	PP	/XLS/	PoA 4791- CPA 12-19 MP#3 ER calculator ver 1.0 11092020.xlsx	-	PP
19	PP	/VVS/	CDM validation and verification standard for programmes of activities (Version 2.0)	http://cdm.unfccc.int/Reference/Standards/index.html	
20	UNFCCC	/SUR/ /USAGE/	- Monitoring Survey Records for MS#1, MS#2 and MS#3 - Monitoring Survey worksheets integrated as part of Emission reduction worksheet - Reliability check spreadsheet as part of Emission reduction worksheet - Standard: Sampling and Survey for project activity and PoA version 08.0	-	Other
21	PP	/WBT/	- WBT Records for MS#1 (2018), MS#2(2019) and MS#3(2020) - PoA 4791 MP#3 WBT Calculator MS1-MS3 Combined ver 1.0 11092020.xlsx	-	Other
22	PP	/TS/	- Technical Specification of Bondhu Chulha (Domestic/Non-Domestic) - Performance Specifications of Domestic and Non-Domestic Bondhu Chula issued by SZ Consultancy Services Limited dated 10.09.2012	-	
23	PP	/OSVE/	Evidence to support onsite visit exemption – ERPA showing delivery commitments	-	Other
24	UNFCCC	/TOOL30/	Calculation of the fraction of non-renewable biomass version 1.0	-	Other

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

Table 3. Remaining FARs from validation and/or previous verification

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

Table 4. CLs from this verification

CL ID	Section no.	Date:
01	E.1	23/09/2020
Description of CL		
Parameter η_{new}		

1. It is identified that the applied efficiency values of the sampled WBT Test reports are higher than the anticipated values under PoA-DD and CPA-DD. Justification/ reasoning is requested for increase in the value of this parameter for Domestic and Non-Domestic stoves.
2. The description under the row "Monitoring Equipment" is ambiguous as the sentence is not clear if the equipment are externally calibrated or new equipment are purchased for the applied monitoring period. Relevant supportive documents are requested.

CME response**Date:** 29/09/2020

1. The parameter η_{new} is a monitoring parameter which is liable to change during the course of the crediting period. The values indicated in the PoA-DD (0.255 for domestic and 0.210 for non-domestic) are only indicative and reflect the average values of various types of ICS that were prevalent in the country at the time of PoA registration (refer ICS technical Manual, table 3, page 43, by Village Education Resource Center (VERC) and Winrock International and sponsored by The World Bank). The value of 0.255 for domestic ICS was arrived at by taking the average of thermal efficiencies of various models listed in the report, ranging from 0.210 to 0.300. For non-domestic ICS the lowest value was considered for ex-ante calculation purposes as a conservative measure in the PoA-DD and CPA-DD.

The rated / design efficiency of the ICS included in the CPAs covered under the monitoring report is as follows:

Domestic: 0.2885

Non-domestic: 0.2430

In last MP (first MP for the CPAs covered, in the MR being verified) the monitored values of thermal efficiencies were:

Domestic: 0.271

Non-Domestic: 0.231

In current MP, the monitored values of thermal efficiencies are:

Monitoring Session	Thermal Efficiency (fraction)	
	Domestic	Non- Domestic
MS#1	0.267	0.228
MS#2	0.262	0.224
MS#3	0.257	0.221

Thus, the monitored thermal efficiencies are deemed appropriate.

2. The measurement equipment used for conducting WBTs for determination of η_{new} were newly purchased so that the measurement was done with necessary guarantees. For the WBTs conducted in MS#1, the testing equipment were purchased in December 2017. For the WBTs conducted in MS#2, new set of equipment were bought in October 2018. For the WBTs conducted in MS#3, new set of equipment were bought in September 2019. The purchase invoices / photographs for the testing equipment for each of the Monitoring Sessions (MS#) are being submitted. The equipment details have been added in the revised MR.

Documentation provided by the CME

MS#1 Equipment Purchase invoice dated 28-12-2017

MS#2 Equipment Purchase invoice dated 08-10-2018

MS#3 Equipment Purchase invoice dated 08-09-2019

MS#1 Equipment photographs of thermometer, moisture meter and weighing scales

MS#2 Equipment photographs of thermometer, moisture meter and weighing scales

MS#3 Equipment photographs of thermometer, moisture meter and weighing scales

PoA 4791 - CPA 12-19 MP#3 MR version 2.0 28092020

18.0 4791-Stove-Efficiency Certificate

DOE assessment**Date:** 16/10/2020

1. Thermal Efficiency

The verification team has reviewed the submitted equipment purchase invoice and drawn below tabulated inferences:

Equipment	Thermal Efficiency	80% confidence interval	Supporting document
Bondhu Chula (Domestic)	28,85 %	28.3% - 29.4%	Performance Specifications of Domestic and Non-Domestic Bondhu Chula issued by SZ Consultancy Services Limited dated 10.09.2012
Bondhu Chula (Non-Domestic)	24.30 %	23.9% - 24.7%	Performance Specifications of Domestic and Non-Domestic Bondhu Chula issued by SZ Consultancy Services Limited dated 10.09.2012

In addition, the verification team has assessed the submitted WBT calculation which confirm that the WBT is determined following the version 4.2.3 available at Clean Cooking Alliance GACC website:

<http://cleancookstoves.org/binary-data/DOCUMENT/file/000/000/399-1.pdf> . Thus, the application of the values for η_{new} is justified.

2. QA/QC measures:

The VT has assessed the invoices for the MS#1, MS#2 and MS#3 and confirms that the new equipments were purchased for conducting WBT as a stated under section E.2 of MR (Refer parameter η_{new}). The finding has been closed.

CL 01 has been CLOSED.

Table 5. CARs from this verification

CAR ID	01	Section no.	A.1, C.1	Date:	23/09/2020
Description of CAR					
Copy of the "Peer review paper published in PNAS, July 3, 2012, vol. 109, no. 27, 10815–10820, "Low demand for non-traditional cookstove technologies" by Mobarak et al" is requested to substantiate the claims made under section A.1 of MR pertaining to application of traditional cookstoves.					
The section C.1 of MR lacks information of the actual implemented ICS (compared to the estimations made under CPA-DD) to confirm the implementation of CPA.					
CME response					Date: 29/09/2020
Copy of the "Peer review paper published in PNAS, July 3, 2012, vol. 109, no. 27, 10815–10820, "Low demand for non-traditional cookstove technologies" by Mobarak et al" is being submitted, to substantiate the claims made under section A.1 of MR pertaining to application of traditional cookstoves.					
The number of domestic / non-domestic units installed under each CPA is already mentioned in section C.1 para(c) of the MR submitted. Also, the date of installation of first ICS under each CPA is also mentioned in section C.1 para(d) of the MR submitted, thus clearly substantiating actual implementation of the CPAs.					
Documentation provided by the CME					
12.0 PNAS-2012-Mobarak-10815-20					
DOE assessment					Date: 16/10/2020
"Peer review paper published in PNAS, July 3, 2012, vol. 109, no. 27, 10815–10820, "Low demand for non-traditional cookstove technologies" by Mobarak et al" is reviewed and it is confirmed that "three-stone" cooking stove is prevalent in Bangladesh. The finding has been CLOSED.					
The section C.1 of the MR is updated with details of implementation status clearly stating the relevant dates (date of installation) under the CPA. The implementation status is verified by the assessment team with the help of sales document/ invoice. The finding has been CLOSED.					
CAR 01 has been CLOSED.					

CAR ID	02	Section no.	D	Date:	23/09/2020
Description of CAR					

The statement under section D of MR "For each of these monitoring events, sampling was done at cross CPA level, using 95/10 as confidence / precision. Monitoring consisted of checking the representative samples against monitoring plan parameters using a questionnaire-based survey and conducting WBTs to determine ICSs' thermal efficiency"

is not exactly in line with the CPA-DD section D.7.2. Description of the monitoring plan

"Sample size shall be chosen for a 90/10 precision (90% confidence interval and 10% margin of error) or 95/5 in case of biennial surveys wherever reasonably possible."

Transparent explanation is missing.

CME response

Date: 29/09/2020

The sampling approach applied in the PoA-DD/CPA-DD is 90/10 on account of annual monitoring. The approach used in the concerned monitoring period (95/10) is in line with the Sampling Standard (Version 8), para 22, which states the following:

"Parameter values shall be estimated by sampling in accordance with the requirements in the applied methodology separately and independently for each of the CPAs included in a PoA except when a single sampling plan covering a group of CPAs is undertaken applying 95/10 confidence/precision for the sample size calculation."

Besides, the confidence/precision levels mentioned in the PoA-DD / CPA-DDs indicate the minimum level of compliance. Applying 95% confidence instead of 90% is more conservative.

Documentation provided by the CME

-

DOE assessment

Date: 16/10/2020

The applied confidence interval and margin of error are better compared to stipulation under the CPA-DD, hence, explanation is accepted.

CAR 02 has been CLOSED.

CAR ID	03	Section no.	E.2	Date:	23/09/2020
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Description of CAR

The section E.2 of MR is not accurately and consistently reporting the below parameters with respect to the CPA-DD

Sr. No	Parameter	Description	Measured/calculated/default	Measuring/reading/recording frequency	Calculation method	QA/ QC Procedures	Additional comments
1.	η_{new}				X		X
2.	N_{all}	X	X	X	X	X	
3.	SOF					X	X

CME response

Date: 29/09/2020

The necessary changes have been made to section E.2 of the MR.

Documentation provided by the CME

PoA 4791 - CPA 12-19 MP#3 MR version 2.0 28092020

DOE assessment

Date: 18/10/2020

The Verification Team compared the revised MR with the CPA-DD. It is confirmed that the consistency is maintained between the CPA-DD and the MR section E.3.

CAR 03 has been CLOSED.

CAR ID	04	Section no.	-	Date:	23/09/2020
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Description of CAR

The following supporting documents and technical specifications of the ICS are requested for verification: -

1. Customer Database sheet
2. Contractual agreement in between the CME and the DO
3. Customer terms & conditions document provided as Proof of Carbon Credits waiver by End user
4. Sample customer agreement document provided as proof of ICS distribution receipt
5. Evidence for random number generator for sampling
6. Sample Monitoring Survey Forms
7. CPA Distribution Records
8. Reliability Check
9. Random number generator
10. Sample size and Reliability check for WBT integrated into the ER worksheet

11.	Training records of imparted for below fields:	
	• Partner Training Manual.pdf • Training Attendance Sheets.pdf • Partner Training Workshop Photographs • Monitoring survey training photographs • Attendance of Monitoring survey training Sheets.pdf • WBT team training records • Experience - Field monitoring and performance testing	
12.	Evidence to support onsite visit exemption – ERPA showing delivery commitments	
13.	Bill for monitoring equipment	
14.	Stove sale and Customer Agreement form	
CME response		Date: 29/09/2020
The requested documents are being submitted.		
Documentation provided by the CME		
Sl. No.	Document Requested	Document being submitted
1	Customer Database sheet	PoA 4791 MP#3 Sampling and Installation database– The database lists all ICS being credited under the monitoring period including details like name, address, contact number of user, ICS model, unique serial number, date of installation etc.)
2	Contractual agreement in between the CME and the PO	The agreement between CME and PO is being submitted
3	Customer terms & conditions document provided as Proof of Carbon Credits waiver by End user	Refer PoA 4791 MP3 Sample End User Agreement
4	Sample customer agreement document provided as proof of ICS distribution receipt	Same as 3 above
5	Evidence for random number generator for sampling	Refer Random Number snapshots taken from www.stattrek.com
6	Sample Monitoring Survey Forms	Refer PoA 4791 MP3 Survey Records
7	CPA Distribution Records	Same as 1 above
8	Reliability Check	Refer PoA 4791- CPA 12-19 MP#3 ER calculator ver 1.0 11092020
9	Random number generator	Same as 5 above
10	Sample size and Reliability check for WBT integrated into the ER worksheet	Refer PoA 4791- CPA 12-19 MP#3 ER calculator ver 1.0 11092020
11	Training records of the personnel on the following aspects	1. Partner Training Manual 2. Training Attendance sheets 3. Partner Training Workshop Photographs 4. Monitoring survey training Photos 5. Attendance of Monitoring survey training 6. WBT team training records 7. Experience - Field monitoring and performance testing
12	Evidence to support onsite visit exemption – ERPA showing delivery commitments	ERPA being submitted
13	Bill for monitoring equipment	Refer WBT equipment receipts and photographs
14	Stove sale and Customer Agreement form	Same as 3 above
DOE assessment		Date: 18/10/2020
The pointwise assessment is presented below:		
1. Customer Database sheet: The Verification Team has reviewed the Customer Database sheet ("1.0 7.0 0.9 PoA 4791 MP#3 Sampling and Installation database.xlsx"). The submitted database separately captures the domestic and non-domestic ICS installations under tabs: "CPA 12-19 data - Domestic" and "CPA 12-19 data – Non-Domestic". The Verification Team confirms that, following		

the requirements of capturing the unique attributes including name, address, contact number of the user, ICS model, unique serial number, date of installation is duly captured which could also be further verified by interviewing end users during remote interview. This fulfills the requirement as stated under the section A.4.2, section A.4.4.2 Monitoring Plan, section E.7.2 of the PoA-DD. The Verification Team confirms that the CME is appropriately applying the number of stoves into the ER worksheet for evaluation of the CERs. The finding has been CLOSED.

2. **Contractual agreement in between the CME and the PO:** The Verification Team has reviewed the agreement between the CME and PO and also interviewed the CME. Based on the review of contract and outcomes of interview are reflected under D.3 of this FVR, the VT confirms that the roles of the PO are clearly defined which are distributing the ICS in Bangladesh, training the technicians, entrepreneurs and working on contractual basis, supervise data into sales records, transfer information of each ICS to the installation record etc which are found consistent with the requirements of the PoA-DD (section A.2, section A.4.2, A.4.4 of PoA). Finding has been CLOSED.
3. **Customer terms & conditions document provided as Proof of Carbon Credits waiver by End user:** The VT reviewed the PoA 4791 MP3 Sample End User Agreement (in local language Bengali). The VT confirms that the end user agreement clearly states pertaining to the transfer of title of Carbon to the PO by the end user. Finding has been CLOSED.
4. **Sample customer agreement document provided as proof of ICS distribution receipt** Assessed above. Finding has been CLOSED.
5. **Evidence for random number generator for sampling:** The random number generator is submitted. The VT confirms that the CME has utilized the Stat Trek to generate the random numbers for MS1 Domestic, MS1 Non-Domestic, MS2 Domestic, MS2 Non-Domestic, MS3 Domestic, MS3 Non-Domestic (3 monitoring events in compliance with annual monitoring frequency). The VT also confirms that the random numbers were generated by ensuring that the duplicates are avoided. The number of random numbers also corresponds with the sample size for the MS1, MS2 and MS3.
6. **Sample Monitoring Survey Forms:** OK, The Monitoring and Survey forms are received. The VT has verified the entries of the Monitoring survey with the forms. The VT confirms that no inconsistency was observed, thus the outcomes of the Monitoring Survey is deemed as appropriate. Finding has been CLOSED.
7. **CPA Distribution Records:** Assessed under point 1 Finding has been CLOSED.
8. **Reliability Check:** Accepted. The submitted "PoA 4791- CPA 12-19 MP#3 ER calculator ver 1.0 11092020" already has the reliability determination in accordance with standard for sampling and survey and guidelines for sampling and survey for project and PoA in its most recent version applied. Applied relative precision and confidence interval are assessed to be sufficiently met for all the sampling parameters as assessed by verification team. The VT reviewed the same and found the representation as accurate.
9. **Random number generator:** Already assessed above. Finding has been CLOSED.
10. **Sample size and Reliability check for WBT integrated into the ER worksheet:** The sample size and reliability check is duly integrated into the ER worksheet, please refer assessment above in totality. The VT confirms that the correct input values and assumptions were applied to calculate the sample size. Furthermore, the CME has selected samples in line with the outcomes of the sample size determination. The reliability test indicate that the results were within the applied relative precision. Finding has been CLOSED.
11. **Training records of the personnel on the following aspects:** The training records confirm that the necessary training on "training of technicians", "marketing activities" "operation and maintenance of ICS", "data management", "Surveys", "quality monitoring", "rules of CDM and PoA", "management skills" etc were conducted. The above topics were evident from the submitted documents as stated above by the CME. Finding has been CLOSED.
12. **Evidence to support onsite visit exemption – ERPA showing delivery commitments:** Delivery deadlines were transparently stated. Finding has been CLOSED.
13. **Bill for monitoring equipment:** The bills are assessed. The VT confirms that duly calibrated instruments were deployed for arriving at the WBT results.
14. **Stove sale and Customer Agreement form:** Already assessed above under point 3. Finding has been CLOSED.

CAR 04 has been CLOSED.

Table 6. FARs from this verification

CDM-PoA-VCR-FORM

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

Appendix 5. Monitored Parameters

Table A-5: Periodic Verification Checklist – Monitored Parameters

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.																							
A. N _{all}		Total number of stoves installed																									
a) Measurement / Determination method (VVS, §§ 389-393) Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)). Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements. Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.	/IM01/ /IM03/ /PoA-DD/ /CPA-DD/ /MR/ /AMS II.G/ /DB/ /RC/ /XLS/ /VAL/	<i>Description:</i> The parameter is monitored to determine the baseline emissions. The number of ICS installed is tracked through ICS Installation Database and recorded appropriately by SZCSL. The monitoring (at time of installation) involves the recording ICS type, ICS unique serial number, Date of installation, End user details, address, location etc. The CPA implementer excludes the subsequent ICS from the ER calculations, in case an existing Bondhu Chulha is found at the household, thus ensuring that only one project device is credited per household. For the applied monitoring period no ICS were eliminated from the ER calculation on account of this. This is verified by the Assessment Team. The installation summary of the ICS population is correctly presented as below. <table><tr><th>Parameter</th><th colspan="2">Population</th></tr><tr><td rowspan="5">N_{all}</td><td colspan="2">Domestic</td></tr><tr><td>Strata</td><td>Population</td></tr><tr><td>MS#1</td><td>433,052</td></tr><tr><td>MS#2</td><td>433,052</td></tr><tr><td>MS#3</td><td>433,052</td></tr><tr><td rowspan="4">N_{all}</td><td colspan="2">Non-Domestic</td></tr><tr><td>MS#1</td><td>4,164</td></tr><tr><td>MS#2</td><td>4,164</td></tr><tr><td>MS#3</td><td>4,164</td></tr></table> The verification team confirms that each ICS in the installation database, is traceable by uniquely identifiable ICS ID number. <i>Verifier's action:</i> The verification team remotely pulled random end user agreement records and compared the details with the information in the provided ICS	Parameter	Population		N _{all}	Domestic		Strata	Population	MS#1	433,052	MS#2	433,052	MS#3	433,052	N _{all}	Non-Domestic		MS#1	4,164	MS#2	4,164	MS#3	4,164	CAR 04	OK
Parameter	Population																										
N _{all}	Domestic																										
	Strata	Population																									
	MS#1	433,052																									
	MS#2	433,052																									
	MS#3	433,052																									
N _{all}	Non-Domestic																										
	MS#1	4,164																									
	MS#2	4,164																									
	MS#3	4,164																									

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		installation database. Furthermore, the team randomly selected households from the database to compare the information in the database with the actual stoves being used. The samples covered under the PP monitoring survey were also compared with corresponding installation records and were found ok. <i>Conclusion:</i> The way of recording all stoves data (including end user detail) complies with the registered monitoring plan. CME is requested to submit complete ICS database (CAR 04).		
b) Accuracy and QA/QC Procedure (VVS, §§ 394-400) <i>In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.</i> <i>Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.</i> <i>Include calibration dates and information in validity of the installed monitoring equipment in the table in Annex 2.</i>	/DB/ /TRG/ /MR/ /Training/ /POA-DD/ /CPA-DD/ /AMS II.G/ /XLS/ /VERIF/ /VAL/	<i>Description:</i> The number of stoves installed is confirmed and ensured by checking of the Installation database, survey records and remote assessment verification by contacting end users. Total number of stoves installed is sourced from installation database containing record of all installations and date of each installation. It is noted that there is no change in this data during this monitoring period (433,052 domestic ICS 4,164 non-domestic ICS) compared to that reported in previous monitoring period. During the remote assessment, the Verification Team verified samples of MS#1, MS#2 and MS#3 depending on service type and found the information available in the database to be consistent with onsite observations. <i>Verifier's action:</i> The verifier cross-checked all documents: Installation Records and Sampling surveys and carried out remote interviews. <i>Conclusion:</i> No significant discrepancies were noted except CAR 04, CAR 02.	CAR 02, CAR 04	OK
c) Correctness (VVS, §§ 389-393) <i>Determine whether the value given in the monitoring report is correct or determined in a conservative manner.</i> <i>In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment</i>	/MR/ /DB/ /XLS/ /POA-DD/ /CPA-DD/ /AMS	☐ Correct ☒ Not correct (initial assessment) <i>Description:</i> Inconsistency is identified and CAR 02, CAR 04 has been raised. <i>Verifier's action:</i> The verification team compared the value of the parameter cross checking the value in the databases with information given in the MR	CAR 02, CAR 04	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.																																																	
<i>of the conservativeness of the approach used should be given. In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.</i>	II.G/ /VERIF/ /VAL/ /USAGE/	along with monitoring and corresponding remote interviews, Installation Records with the ICS sampled end users <i>Conclusion:</i> The reported values are deemed as not correct. Please refer CAR 02, CAR 04.																																																			
2. SOF		ICS Operation Fraction - To determine only ICS that are still operating, measured ex-post through survey/ user feedback																																																			
a) Measurement / Determination method (VVS, §§ 389-393) <i>Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)). Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements. Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.</i>	/IM01/ /IM03/ /PoA-DD/ /CPA-DD/ /SAMPL E/ /FMR/ /XLS/ /MR/	<i>Description:</i> The parameter is applied to determine stoves that are still operating, measured ex- post through survey user feedback. The determination is based on survey of samples for each ICS category (domestic and non-domestic). Monitoring surveys were carried out during 14-01-2018 to 05-02-2018 for MS#1, 14-01-2019 to 12-02-2019 for MS#2 and 14-01-2020 to 16-02-2020 for MS#3 by SZCSL. The applicable annual monitoring frequency was observed for the monitoring survey, consistent with the monitoring frequency as specified in CPA-DDs. The sampling frame for the surveys included all ICS installed under two categories i.e. domestic and non-domestic ICS. Simple random sampling was applied to each category separately. The ICS were randomly sampled from a list of all the participating ICS for each category. Monitoring survey was conducted for randomly selected domestic ICS samples and non-domestic ICS as given below: Sampling Approach: <table><tr><th>Parameter</th><th>Sampling approach</th><th>Sampling Type</th><th colspan="2">Population</th><th colspan="2">Sample Size</th></tr><tr><td rowspan="5">SOF</td><td rowspan="5">StRS</td><td rowspan="5">PS</td><td colspan="4">Domestic</td></tr><tr><td>Strata</td><td>Population</td><td>Sample required</td><td>Samples covered</td></tr><tr><td>MS#1</td><td>433,052</td><td>43</td><td>53</td></tr><tr><td>MS#2</td><td>433,052</td><td>55</td><td>63</td></tr><tr><td>MS#3</td><td>433,052</td><td>68</td><td>71</td></tr><tr><td rowspan="4">SOF</td><td rowspan="4">StRS</td><td rowspan="4">PS</td><td colspan="4">Non-Domestic</td></tr><tr><td>MS#1</td><td>4,164</td><td>30</td><td>36</td></tr><tr><td>MS#2</td><td>4,164</td><td>32</td><td>36</td></tr><tr><td>MS#3</td><td>4,164</td><td>43</td><td>45</td></tr></table>	Parameter	Sampling approach	Sampling Type	Population		Sample Size		SOF	StRS	PS	Domestic				Strata	Population	Sample required	Samples covered	MS#1	433,052	43	53	MS#2	433,052	55	63	MS#3	433,052	68	71	SOF	StRS	PS	Non-Domestic				MS#1	4,164	30	36	MS#2	4,164	32	36	MS#3	4,164	43	45	CAR 04	OK
Parameter	Sampling approach	Sampling Type	Population		Sample Size																																																
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Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		The verification team confirms that each ICS was traceable by uniquely identifiable ICS ID number. The sampling methodology as stated under section E.3 of MR is checked and verified and deemed as correct. It is further noted that slightly higher number of samples were selected for monitoring than that required to ensure that the desired precision / confidence is achieved as well as covers for any non-responses. The formula used to calculate the monitored value of operational ICS of is as follows: $\text{SOF} = n_{\text{operational}} / n_{\text{total}}$ Where: n = number of samples Data was collected using survey questionnaire forms to enable surveyors to collect applicable and necessary information during monitoring visit to the sampled user. Procedures for sampling have been duly articulated in the monitoring report, and a sample of survey questionnaires furnished to DOE. The survey forms were verified by the Verification Team and deemed as complete and relevant with respect to the monitoring requirements. <i>Verifier's action:</i> The verifier checked the field records and procedures to determine the monitoring parameter value, in line with CDM sampling guidelines. Furthermore, the verification team selected samples from PP records and conducted remote visits (via video calls) to compare the information in the PP records with the actual observations during audit. The Verification team also confirmed the timing of the monitoring visit with the selected samples and found the responses corresponding to the monitoring event duration reported by SZCSL. <i>Conclusion:</i> The way of recording all stoves data (including end user detail) complies with the registered monitoring plan. The sampling and monitoring approach is in line with registered monitoring plan. However, CAR 02 has been raised and resolved.		

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
b) Accuracy and QA/QC Procedure (VVS, §§ 394-400) <i>In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.</i> <i>Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.</i> <i>Include calibration dates and information in validity of the installed monitoring equipment in the table in Appendix 6.</i>	/DB/ /TRG/ /MR/ /Training/ /PoA-DD/ /CPA-DD/ /IM01/ /XLS/	<i>Description:</i> Monitoring surveys were conducted using simple random sampling for each category following the Sampling and surveys for CDM project activities and programme of activities. As described above, it is confirmed that sampling was accurate. The Verification Team assessed the training records of team prior to monitoring and it is confirmed that the monitoring staff had the appropriate skills and expertise to administer relevant surveys / tests and quality checks, ensuring the integrity of information flow to the CME. CAR 02 has been raised to reconfirm the appropriateness of determination of sample size. <i>Verifier's action:</i> The VT has carried out desktop reviews of the field monitoring reports to establish if the sample sizes and procedures were carried out correctly. Interviews with staff were also conducted during remote audit. <i>Conclusion:</i> The CME has followed the sampling plan and procedures for determination of factor for "ICS Operation Fraction - To determine only ICS that are still operating, measured ex-post through survey/ user feedback", however CAR 02 has been raised and resolved.	CAR 02	OK
c) Correctness (VVS, §§ 389-393) <i>Determine whether the value given in the monitoring report is correct or determined in a conservative manner.</i> <i>In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given.</i> <i>In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.</i>	/MR/ /FMR/ /IM03/	☐ Correct ☒ Not correct (initial assessment) <i>Description:</i> The parameter has been measured correctly in line with monitoring plan subjected to submission of relevant database. <i>Verifier's action:</i> The values given per year were checked against the excel report and calculations. <i>Conclusion:</i> The values presented in the MR is in accordance with the verified survey data analysis sheet and remote interview with the team conducted the field monitoring survey, However CAR 02, CAR 04 are raised.	CAR 02 CAR 04	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.																																																	
3. η_{new}		Efficiency of the system being deployed as part of the project activity																																																			
a) Measurement / Determination method (VVS, §§ 389-393) Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)). Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements. Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.	/IM01/ /IM03/ /PoA-DD/ /CPA-DD/ /AMS II.G/ /WBT/ /WBTP/ /XLS/ /PRC/ /CAL/ /TRG/ /MR/	<i>Description:</i> The efficiency of ICS for each category (domestic / non-domestic) was determined by conducting water boiling tests (WBT), in line with applied version of AMS II.G and the registered monitoring plan. The PP employed newly purchased instruments (which are factory calibrated at the time of purchase) for the tests. The instruments include Digital Thermometer, Digital Weighing Scale and Digital Moisture Meter. The technical specification of the equipment was duly verified by the Verification Team and deemed accurate and acceptable. However, please refer CL 01. CAR 04 was also raised as WBT records are formally requested Sourced from WBT test records, values applied in ER calculator and WBT calculator are comparable to the values available in the WBT records. The WBT was carried out by SZCSL using Global Alliance for clean cooking, Water Boiling Test' protocol version 4.2.3. SZCSL has followed annual monitoring frequency consistent to the frequency specified in CPA-DDs. The sample size included all ICS divided under two categories (domestic and non-domestic ICS) and were randomly sampled from the randomly selected ICS for monitoring SOF for a given category separately. Sampling Approach: <table><tr><th>Parameter</th><th>Sampling approach</th><th>Sampling Type</th><th colspan="2">Population</th><th colspan="2">Sample Size</th></tr><tr><td rowspan="5">η_{new}</td><td rowspan="5">SiRS</td><td rowspan="5">PS</td><td>Strata</td><td>Population</td><td>Sample required</td><td>Samples covered</td></tr><tr><td colspan="4">Domestic</td></tr><tr><td>MS1</td><td>433,052</td><td>7</td><td>9</td></tr><tr><td>MS2</td><td>433,052</td><td>7</td><td>8</td></tr><tr><td>MS3</td><td>433,052</td><td>7</td><td>9</td></tr><tr><td rowspan="4">η_{new}</td><td rowspan="4">SiRS</td><td rowspan="4">PS</td><td colspan="4">Non-Domestic</td></tr><tr><td>MS1</td><td>4,164</td><td>7</td><td>7</td></tr><tr><td>MS2</td><td>4,164</td><td>7</td><td>7</td></tr><tr><td>MS3</td><td>4,164</td><td>7</td><td>7</td></tr></table> <i>Verifier's action:</i> The verification team has reviewed the step-by-step protocol followed in	Parameter	Sampling approach	Sampling Type	Population		Sample Size		η_{new}	SiRS	PS	Strata	Population	Sample required	Samples covered	Domestic				MS1	433,052	7	9	MS2	433,052	7	8	MS3	433,052	7	9	η_{new}	SiRS	PS	Non-Domestic				MS1	4,164	7	7	MS2	4,164	7	7	MS3	4,164	7	7	CL 01, CAR 04	OK
Parameter	Sampling approach	Sampling Type	Population		Sample Size																																																
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Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		determining the sample size, selecting appropriate test conditions and conducting the overall WBTs. The key personnel of WBTs were interviewed on procedures, recording calculation and analysis of result and associated training. The WBT records have been analyzed. <i>Conclusion:</i> The calculations of sample sizes and measurement procedures have largely followed the GACC (Global Alliance for Clean Cooking) WBT protocol and followed the excel calculation sheets, however during course of verification CL 01 has been raised and closed successful.		
b) Accuracy and QA/QC Procedure (VVS, §§ 394-400) <i>In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.</i> <i>Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.</i> <i>Include calibration dates and information in validity of the installed monitoring equipment in the table in Appendix 6.</i>	/CAL/ /WBT/ /IM01/ /IM03/ /POA-DD/ /CPA-DD/ /AMS II.G/ /MR/	<i>Description:</i> During Remote Assessment it was verified that the equipment used in conducting the WBTs (Thermometers, scales, moisture meter) were newly purchased (factory calibrated at the time of purchase) and applied as per product specifications. However, the draft MR did not clearly confirm the QA/ QC measures applied. CL 01 has been raised. <i>Verifier's action:</i> The audit team remotely interviewed the WBT expert team along with other relevant staff members present. Questions included testing procedures, QA/QC measures, calculations and testing conditions. The stoves selected were checked and compared with the information in the WBT records. <i>Conclusion:</i> It is concluded that the WBT procedures were followed to ensure that the results are as accurate as possible. It was also observed that all the above-mentioned equipment was new at the time of conducting WBTs and all the equipment were factory calibrated at the time of purchase. Further, PP confirmed that measurement equipment will not be recalibrated but for each subsequent measurement new equipment will be purchased. This is reasonable as there is no related entity in the host country which is able to conduct related calibrations, as per DOE host country knowledge and experience. Therefore, equipment would have to be sent abroad and calibration would be more expensive than newly purchasing the measurement	CL-01	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		equipment. Therefore, no validity of calibration is stated in MR which is reasonable and plausible. As verified from the WBT records and subsequent interviews during remote assessment, the WBTs were conducted as per above stated schedules, thus, ensuring that measurement taken were reliable and accurate. Purchase records were verified by the assessment team and found to be duly purchased and hence, appropriate. However, please refer CL 01.		
c) Correctness (VVS, §§ 389-393) <i>Determine whether the value given in the monitoring report is correct or determined in a conservative manner.</i> <i>In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given.</i> <i>In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.</i>	/MR/ /IM03/ /IM01/	☐ Correct ☒ Not correct (initial assessment) Description: Values have been presented in section E.2 of the MR and as per the provided excel calculations. The protocol has been followed and therefore the values are deemed to be correct. Still CL 01 is raised. Verifier's action: The random sampling procedures as well as testing procedures have been interrogated. The stove thermal efficiency values were verified by the DOE based on the following: 1. Review of the WBT protocol 2. Review of the WBT data recording sheet and its compliance wrt to WBT protocol 3. Review of measuring equipment used during WBTs for calibration and accuracy. 4. Review of original test observation sheets and corresponding WBT calculator and ER calculator to verify correct transfer of information from point of monitoring to ER calculator 5. Review of WBT calculator for correctness of calculations in line with WBT protocol. 6. By conducting interviews of the WBT monitoring team on the following: a. Review of the monitoring team prior experience on conducting WBTs. b. Test procedure followed while conducting WBTs to verify their competence towards performing WBTs correctly and accurately and in line with WBT protocol.	CL-01	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		c. Usage and handling of the monitoring equipment to verify that the measurements were taken by the monitoring staff correctly and accurately. d. Knowledge of the WBT test observation sheet to verify that measured data was recorded accurately and correctly. 7. Additionally, during the field remote assessment, the audit team leader interviewed the ICS users (of WBT samples) on the following points: a. The tentative date/month of visit of WBT team for testing stove, and cross verified that with date of test specified on corresponding test observation sheet. b. The time taken by the WBT team to complete the test and cross verified that with duration of tests specified on corresponding test observation sheet. c. The number of test cycles conducted by the WBT team to be 3 rounds of Cold Start + Hot start each d. The general test procedure followed by the WBT team to verify that tests were performed in the field properly and in line with the WBT protocol e. Review of photographs taken by the WBT monitoring team at the time of conducting tests and cross verifying the same during the actual visit (for type of stove and serial number of stove). Thus, through document review, interviews of WBT team and interviews of end user, the DOE verified the efficiency test conducted, procedure followed, and stove thermal efficiency presented in the work sheet. Based on above, verification team can conclude the monitoring procedure and result as appropriate and acceptable. <i>Conclusion:</i> The calculations have been checked, and the verification team has no significant doubt about the correctness of the presented values. The conformance on the values is subjected to closure of CL 01.		

Appendix 6. Calibration dates and validity of installed monitoring equipment

Table A-6: Periodic Verification Checklist – Calibration details

Monitoring equipment	Related monitoring parameter as per applicable registered monitoring plan	Serial number	Type	Accuracy or accuracy class	Previous calibration (last calibration before start of this monitoring period)	Calibration date(s) during this monitoring period	Validity of calibration(s)	Delay in calibration: yes/no	Period of delayed calibration
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	☐ No ☐ Yes	From: To:
-	-	-	-	-	-	-	-	☐ No ☐ Yes	From: To:

* All equipments are calibrated by the supplier.

Document information

<i>Version</i>	<i>Date</i>	<i>Description</i>
03.0	31 May 2019	Revision to: • 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		