
 <p style="text-align: center;">Verification and certification report form for CDM programme of activities (Version 03.0)</p>		
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)	IDCOL Improved Cook Stove Program (10512)	
Version number(s) of the PoA-DD(s) to which this report applies	03	
Version number of the verification and certification report	3.0	
Completion date of the verification and certification report	28/12/2020	
Monitoring period number and duration of this monitoring period	01, 15/01/2020 to 31/08/2020	
Number and version number of the monitoring report to which this report applies	01, Version 04	
Coordinating/managing entity (CME)	Infrastructure Development Company Limited	
Host Parties	Host Parties of the PoA	Is this a host Party to a CPA covered in this report? (yes/no)
	Bangladesh	Yes
Applied methodologies and standardized baselines	AMS-II.G. ver. 10- Energy efficiency measures in thermal applications of non-renewable biomass Standard 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	805,691 tCO ₂ e	
Certified amount of GHG emission reductions or GHG removals for this monitoring period for the included CPAs covered in this report	456,395 tCO ₂ e	
Name and UNFCCC reference number of the DOE	TÜV SÜD South Asia Private Limited (TÜV SÜD)-E-0005	
Name, position and signature of the approver of the verification and certification report	 Milind Shende	

	Manager, Certification Body TÜV SÜD South Asia Private Limited
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SECTION A. Executive summary

TÜV SÜD South Asia Pvt. Ltd. has performed the first Verification of the aforementioned CDM PoA. The verification is based on the currently valid documentation of the United Nations Framework Convention on Climate Change (UNFCCC).

The verification process includes three phases:

- Desk review of documents;
- On-site sampling, remote assessment and follow-up interviews with the relevant personnel;
- Resolution of outstanding issues and the issuance of final verification report and opinion.

Infrastructure Development Company Limited (IDCOL) is the CME of this PoA which implements the PoA with the help of Partner Organizations (PO) who are mostly NGOs or MFI or Private entity. In this PoA in Bangladesh, IDCOL intends to increase the share of higher efficiency stoves, which have greater impact in terms of reducing GHG emissions and household air pollution. The CPAs under the PoA aid in reducing greenhouse gas (GHG) emissions by replacing traditional wood-fuel stoves with wood-fuel Improved Cook Stoves (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.

The IDCOL Improved Cook Stove Program – CPA 01, which is implemented by IDCOL involves commercial dissemination of 598,906 high efficiency biomass fired cook stoves (ICS) to replace the traditional inefficient cook-stoves in Bangladesh until first monitoring period. During the current monitoring period 456,395 tCO_{2e} GHG emission reduction achieved by CPA. The technical specification of the stoves used in this CPA are

Tier	Stove
Tier 2	Single Mouth 10" with Insulation and Lining
Tier 3	Single Mouth 8" Portable with Insulation and Lining
Tier 3	Double mouth (9" & 8") with Insulation and Lining
Tier 3	Double mouth (10" & 9") with Insulation and Lining

The CPA is a small-scale type II category CPA located within the boundary of Bangladesh.

3 Corrective Action Requests (CAR) and 1 Clarification Request (CLs) were raised during the course of verification process and have been successfully closed. No FAR has been raised.

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 review	On-site inspection	Interview(s)	Verification findings
1.	Team Leader, Verifier & Technical Expert	IR	Murty	Eswar	TUV SUD South Asia	✓		✓	✓
2	Country Expert	EI	Kabir	Humayon	TUV SUD Bangladesh	✓	✓	✓	✓

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	Meesa	Srikanth	TUV SUD South Asia
2	Approver	IR	Shende	Milind	TUV SUD South Asia

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

No.	Risk that could lead to material errors, omissions or misstatements	Assessment of the risk		Response to the risk in the verification plan and/or sampling plan
		Risk level	Justification	
1.	Human errors	Medium	Human error is likely to occur if the monitoring personnel are not trained well or inexperienced in data recording procedures and monitoring processes.	Wherever there is a greater likelihood of errors and chances of incorrect transfer of data, effective data verification should be done on those days/months data. Data related to holiday months need to be checked thoroughly.
2	Design of data management	Medium	Use of spreadsheets without adequate data control, changes/updates, version tracking, traceability and security	Depending on how data is generated, processed, and reported, place greater emphasis on verifying data captured and processed manually and/or in spreadsheets versus those that are generated from an automated system.
3	Manual data	Low	Typographic errors in the spreadsheets and log books while recording.	Require the PPs to assess all the data again and confirm that no further errors are made.

C.2. Consideration of materiality in conducting the verification

The errors identified in the project are below the threshold limit of materiality and hence not material. The GHG emission reductions are calculated without material misstatements

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

Publication has been initiated before the verification activities started. Based on the published MR the assessment team performed a desk review to:

- verify the completeness of the data and the information presented in the MR,
- check the compliance of the MR with respect to the monitoring plan depicted in the registered PoA-DD, CPA-DD and verify that the applied methodology was carried out. Particular attention was paid to the frequency of measurements and the quality assurance and quality control procedures.
- Sampling plan
- evaluate the data management and the quality assurance and quality control system in the context of their influence on the generation and reporting of emission reductions

D.2. On-site inspection

The DOE has conducted the remote audit for this current monitoring period, which is the first verification of this PoA, due to the Covid-19 pandemic and the ongoing travel restrictions outside the country. The audit team leader could not conduct the verification audit in the host country due to the Covid-19 pandemic. This has been done as per the decision taken by CDM-EB on 20 March 2020 and subsequent extension of these alternative measures until 31 December 2020 as per p.26 EB 106. However, the DOE has made use of the local staff in the host country Bangladesh, to conduct the DOE sampling part of the cook stoves, and the verification audit with the CME has been conducted remotely as per the justification provided below:

CDM-EB Guidance	Justification by DOE
If the site visits cannot be postponed, a proper justification should be provided by the DOE why the site visits cannot be postponed, including the demonstration of a significant impact of delaying the site visits on the DOE, or project participants or coordinating/ managing entity (e.g. commitment/ timeline as per the validation or verification contract, CER delivery commitment by project participants) reliance on applicable force majeure provisions in the validation or verification contracts, if needed.	It was checked by the audit team that as per the CER Delivery Agreement with the buyer, timeline for delivery of CERs to buyer is 28 February 2021. Since the MR has been published on 23 rd October 2020, it was not possible to meet the CER delivery commitment from CME by postponing the site visits. Hence the site visits could not be postponed.

<p>If the site visit cannot be postponed but are not conducted due to the COVID-19 pandemic, the DOE may use other standard auditing techniques for validation or verification, as referred to in sections 7.1.3 and 9.1.3 of the VVS-PA and sections 7.1.3 and 10.1.3 of the VVS-PoA. In the above regard, the Board agrees to allow for three months, from 23 March to 23 June 2020, to deviate from the requirements in paragraphs 30 and 339 of the VVS-PA and paragraphs 183 and 321 of the VVS-POA. Where the DOE relies on this temporary measure, it shall describe in the validation/verification report the alternative means used and justify that they are credible and sufficient for the purpose of validation or verification.</p>	<p>The DOE has used other standard auditing techniques for verification, as referred to in section 10.1.3 of the CDM VVS-PoA v2.0.</p> <p>Since an onsite inspection is avoided, the verification team decided to carry out the audit by other means of standard auditing techniques, which included video conference calls, photographs and videos of the site, monitoring equipment installed and measuring devices in place, raw data and interviews. The same is in line with p.322 of VVS for PoA v 2.0.</p> <p>The DOE has conducted sampling by making use of local staff.</p>
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The DOE has conducted web meetings and video conference with PP and their representatives on 24th November 2020. The interviews and discussions were conducted successfully, and it is sufficient for the DOE to verify and prepare the report, in line with p.322 of the CDM VVS PA v2.0.

The DOE has conducted acceptance sampling on 26th November 2020, which has been explained under section D.4 below.

D.3. Interviews

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1.	Baki	Md. Abdul	IDCOL	24/11/2020	Overview of Monitoring process, Implementation and operation of the CPA, CME management	Eswar Murty
2	Haque	Sanjidaa	IDCOL	24/11/2020	Technology, Location of CPAs, Monitoring system and parameters, Implementation of sampling plan	Eswar Murty
3	Kanda	Sandeep	World Bank	24/11/2020	Overview of Monitoring process,	Eswar Murty
4	Dutta	Supratik	EKI Energy Services Ltd	24/11/2020	Technology, Location of CPAs, Monitoring system and parameters, Implementation of sampling plan Cross-check the monitoring report against other sources such as comparable information like raw data, records, etc. Data collection system, Regulatory data: Discussion and Document review. Test reports Verifying the reported emission reductions, quality assurance and quality control system, review of information flows for generating, aggregating and reporting.	Eswar Murty
5	Md. Hobibor Rahman Mondol		Stove User	26/11/2020	Date of installation, number of stoves in the household, Usage rate, Stove performance, Use of baseline stove, as applicable.	Humayon Kabir
6	Md. Dula Akando					
7	Md. Chunnu Bepari					
8	Md. Sekendar Pk					
9	Sree. Ujjol Chandro Das					
10	Johurul Islam					
11	Md. Jolil					
12	Md. Sayed Zaman Shah					
13	Md. Siblu Mia					
14	Md. Ronju Mia					
15	Md. Rezaul Mia					
16	Md. Ali Hasan					
17	Md. Aminul Islam					
18	Md. Ekram Hossain					
19	Md. Ashraf Ali					
20	Md. Anisur Rahman					
21	Md. Attab Hosen					

D.4. Sampling approach

The CME sampling plan consists of monitoring the following parameters as mentioned below:

S. No.	Monitoring Parameter	Description of Monitoring Parameter
1.	$N_{y,i,j}$	Number of project devices of type i and batch j operating during year y
2	μ_y	Adjustment to account for any continued use of pre-project devices during the year y
3	$\eta_{\text{new},i,j}$	Efficiency of the device of each type i and batch j implemented as part of the project activity

The target population is the total ICS population served under the CPA (and covered under the monitoring report), and the sampling frame consists of aggregated data of end-users of the ICS as recorded in the CPA Databases. Due to the large number of ICS installed under the CPA, CME has conducted a representative sampling as part of the CPA Sampling Plan.

The Sampling Standard version 8.0, p.22 mandates application of 95/10 confidence/precision for CPAs solely composed of micro-scale CDM units hence the same was applied as a conservative measure despite the methodology taking precedence.

The sampling was conducted using stratified random sampling technique over the sampling frame. The ICS in the sampling frame were stratified by ICS model

- Tier 2 -Single Mouth 10"
- Tier 3-Single mouth 8"
- Tier-3-Double mouth (9" & 8")
- Tier-3-Double mouth (10" & 9")

and batch j i.e. year of installation (2018, 2019 and 2020).

Thus, the population was categorised into applicable sampling strata for identifying samples for various monitoring parameters, as applicable.

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-DD.

The sample size is determined using the following formulas:

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

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)

For Proportion based parameters($N_{y,i,j}$ and μ_y)

$$V = \frac{SD^2}{p^2} \text{ Where:}$$

$$SD^2 = \frac{\sum_{i=1}^k g_i * p_i * (1 - p_i)}{N}$$

$$p = \frac{\sum_{i=1}^k g_i * p_i}{N}$$

Where,

gi= weight of strata i in the population

i= expected proportion of strata i in the population

k = total number of strata in the population

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

Where

$$SD^2 = \frac{\sum_{i=1}^k g_i * SD_i^2}{N}$$

$$Mean = \frac{\sum_{i=1}^k g_i * m_i}{N}$$

Where,

SDi= expected standard deviation of strata i in the population

mi = expected mean of strata i in the population

The WBT test has been conducted by the CME on 51 nos. of stoves to meet the sampling requirement of monitoring plan of the project activity.

Sampling has been conducted Vintage and Tier wise for the WBT for

$\eta_{\text{new},i,j}$ Efficiency of the device of each type i and batch j implemented as part of the project activity.

Samples covered during monitoring- Vintage 2018

Tier (i)	Stove Type	Sampling frame size	Monitored Sample Size
Tier 2	Single Mouth 10" with Insulation and Lining	1189	3
Tier 3	Single Mouth 8" Portable with Insulation and Lining	58836	8
Tier 3	Double mouth (9" & 8") with Insulation and Lining	1335	3
Tier 3	Double mouth (10" & 9") with Insulation and Lining	278	3

Samples covered during monitoring- Vintage 2019

Tier (i)	Stove Type	Sampling frame size	Monitored Sample Size
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Tier 2	Single Mouth 10" with Insulation and Lining	8289	3
Tier 3	Single Mouth 8" Portable with Insulation and Lining	284898	8
Tier 3	Double mouth (9" & 8") with Insulation and Lining	4612	3
Tier 3	Double mouth (10" & 9") with Insulation and Lining	808	3

Samples covered during monitoring- Vintage 2020

Tier (i)	Stove Type	Sampling frame size	Monitored Sample Size
Tier 2	Single Mouth 10" with Insulation and Lining	6098	3
Tier 3	Single Mouth 8" Portable with Insulation and Lining	229272	8
Tier 3	Double mouth (9" & 8") with Insulation and Lining	3129	2
Tier 3	Double mouth (10" & 9") with Insulation and Lining	162	4

Sampling for the number of stoves operating- A total of 100 stoves have been sampled by the CME across all the type and model year wise.

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

Stove Type	Year	Stove Model	Stove population	Monitored Sample size
Tier 2	2018	Single Mouth 10" with Insulation and Lining	1189	21
Tier 3	2018	Single Mouth 8" Portable with Insulation and Lining	58836	12
Tier 3	2018	Double mouth (9" & 8") with Insulation and Lining	1335	2
Tier 3	2018	Double mouth (10" & 9") with Insulation and Lining	278	1
Tier 2	2019	Single Mouth 10" with Insulation and Lining	8289	16
Tier 3	2019	Single Mouth 8" Portable with Insulation and Lining	284898	23
Tier 3	2019	Double mouth (9" & 8") with Insulation and Lining	4612	5
Tier 3	2019	Double mouth (10" & 9") with Insulation and Lining	808	3
Tier 2	2020	Single Mouth 10" with Insulation and Lining	6098	5
Tier 3	2020	Single Mouth 8" Portable with Insulation and Lining	229272	9
Tier 3	2020	Double mouth (9" & 8") with Insulation and Lining	3129	2

Tier 3	2020	Double mouth (10" & 9") with Insulation and Lining	162	1
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Sample size calculation is assessed to be in accordance with registered sampling plan in PoA-DD/CPA-DD and Sampling and surveys for CDM project activities and programmes of activities for sampling.

Every individual project stove in the CPA covered under this MR (observed to be uniquely identifiable by its ID number) was allocated a sample number. CME has submitted sample size calculation spreadsheet and random number generator where it was demonstrated that samples are drawn randomly using stratified random sampling approach. DOE further has cross-checked the sampling approach by the CME as per MR against related PoA-DD and CPA-DD. Additionally, the related population size has been checked with corresponding supporting documents (e.g. Total ICS database, ER worksheet). 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 standard.

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 was found to meet the minimum desired confidence and precision levels.

DOE Sampling:

The verification team decided to draw samples mainly from the project samples selected by CME..., Acceptance Sampling approach was employed by verification team, which follows the "Standard for sampling and survey for CDM project activities and programme of activities", version 8.0.

TUV SUD has taken the "Table 1 Sample Size and Acceptance Number" of the guideline into consideration in order to select a random sample from the PP sampling data of 100, and the AQL of 1%, the UQL of 10%, and the producer's and consumer's risk both at 5% were selected. Therefore, a sample size (n) of 10 should have been verified at least, and accordingly with 1 as the maximum number of discrepancies (acceptance number) between the verified data and the PP data.

A total number of 17 samples were selected, consisting of the efficiency and the operation of the stoves, on random basis.

Duration of on-site sampling: 26/11/2020				
No.	Activity performed on-site	Site location	Date	Team member
1.	DOE Sampling of the CME samples	Bangladesh	26/11/2020	Humayon Kabir

$\eta_{new,i,j}$ Efficiency of the device of each type i and batch j implemented as part of the project activity

Tier (i)	Stove Type	Stove Population	Monitored Sample Size CME	DOE Sample Size
Tier 2	Single Mouth 10" with Insulation and Lining	15576	10	1

Tier 3	Single Mouth 8" Portable with Insulation and Lining	573006	24	2
Tier 3	Double mouth (9" & 8") with Insulation and Lining	9076	9	1
Tier 3	Double mouth (10" & 9") with Insulation and Lining	1248	8	1

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

Tier (i)	Stove Type	Stove Population	Monitored Sample Size CME	DOE Sample Size
Tier 2	Single Mouth 10" with Insulation and Lining	15576	42	4
Tier 3	Single Mouth 8" Portable with Insulation and Lining	573006	44	5
Tier 3	Double mouth (9" & 8") with Insulation and Lining	9076	9	2
Tier 3	Double mouth (10" & 9") with Insulation and Lining	1248	5	1

Sampling has been done by the DOE from the CME sample as well as few outside the CME samples.

The details of the households sampled by the DOE local team in Bangladesh are given below:

S.No	ICS ID	Address
1.	14.12-35849	Ranir Para Moddho Para, Sonatola, Bogura
2.	14.12-35784	Agunia Tair Khan Para, Sonatola, Bogura.
3.	14.12-35763	Agunia Tair, Sonatola, Bogura
4.	14.12-37444	Shhipur, Sonatola, Bogura
5.	14.12-37377	Gram Koromja, Sonatola, Bogura
6.	14.12-41225	Katlahar utorpara, Sonatola, Bogura
7.	14.12-41853	Pathanpara, Sonatola, Bogura.
8.	14.12-41854	Pathanpara, Sonatola, Bogura.
9.	14.02-04780	Sabgram Sorkar Para, Bogra, Bogra Sadar
10.	14.02-04793	Sabgram Dokhin Para Paka Rasta, Bogra, Bogra Sadar
11.	14.02-04752	Chok Akas Tara Baser Bridge, Bogra, Bogra Sadar
12.	14.12-35921	Kamar Para Moddho Para, Sonatola
13.	14.12-35809	Hariyakandi Moddho Para, Sonatola
14.	14.12-35799	Uttor Ranir Para, Sonatola
15.	14.12-35997	Bashata Uttor Hindu Para, Sonatola
16.	14.12-35669	Moddho Dighol Kandi Uttor Para, Sonatola
17.	14.12-35666	Ranir Para Hajir Mor, Sonatola

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

Areas of verification findings	No. of CL	No. of CAR	No. of FAR
General			
Compliance of the monitoring report with the monitoring report form			
Remaining forward action requests from validation and/or previous verifications			

CPAs considered for verification and covered in this report			
Programme of activities			
Compliance of the programme implementation with the registered PoA-DD			
Implementation and operation of the management system			
Post-registration changes			
• Corrections			
• Inclusion of a monitoring plan			
• Permanent changes to the registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines, or other methodological regulatory documents ¹			
• Changes to the programme design			
• Addition of CPA inclusion template			
• Change of coordinating/managing entity			
• Changes specific to afforestation and reforestation activities			
Component project activities			
Compliance of the CPA implementation with the included CPA design document		1	
Post-registration changes			
• Temporary deviations from registered monitoring plan, applied methodologies, standardized baselines or other methodological regulatory documents			
• Corrections			
• Changes to the start date-of the crediting period			
• Inclusion of a monitoring plan			
• Permanent changes to the registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines, or other methodological regulatory documents			
• Changes to the project design			
• Changes specific to afforestation and reforestation activities			
Compliance of the registered monitoring plan with applied methodologies and standardized baselines			
Compliance of monitoring activities with the registered monitoring plan			
• Data and parameters fixed ex ante or at renewal of crediting period			
• Data and parameters monitored	1	1	
• Implementation of sampling plan			
Compliance with the calibration frequency requirements for measuring instruments			
Assessment of data and calculation of emission reductions or net removals			
• Calculation of baseline GHG emissions or baseline net GHG removals by sinks			
• Calculation of project GHG emissions or actual net GHG removals by sinks			
• Calculation of leakage GHG emissions			

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

• Summary of calculation of GHG emission reductions or net GHG removals by sinks		1	
• Comparison of actual GHG emission reductions or net GHG removals by sinks with estimates in included CPA			
• Remarks on difference from estimated value in included CPA			
Assessment of reported sustainable development co-benefits			
Global stakeholder consultation			
Others (please specify)			
Total	1	3	

SECTION E. Verification findings

E.1. General

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

Means of verification	To check the compliance of the monitoring report with the latest monitoring report form available at UNFCCC. The latest version of MR form available at UNFCCC is 3.0 and same has used by the CME in the monitoring report.
Findings	No CAR/CL has been raised
Conclusion	TUV SUD confirms that the monitoring report has been prepared on the latest version of the MR available at UNFCCC.

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

Not applicable

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

Title and UNFCCC reference number of the CPA included in the PoA as of the end of this monitoring period	Is the CPA considered for this verification? (yes/no)	The date when the CPA was included	Version of the PoA-DD	Confirmation that a request for issuance including the CPA has been published for the previous monitoring period (Y/N)
IDCOL Improved Cook Stove Program – CPA 01	Yes	15/01/2020	03	N

E.2. Programme of activities

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

Means of verification	IDCOL is the CME of the PoA which is responsible for oversight, policy guidance and monitoring of the Project Management Units. IDCOL will implement the PoA with the help of Partner Organizations (PO) who are mostly NGOs or MFI or Private entity. IDCOL channels grant and capacity building supports to the POs for implementation of the program with the financial assistance from the World Bank. POs conduct demand creation activities and sell ICS and provide after sales services to the households. The POs may engage local entrepreneurs in ICS Manufacturing and Installation activities.
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	<p>An independent PO Selection committee selects the POs to work under the program as per an approved selection criterion whereas an independent Technical Committee (TC) determines technical standards, approves eligible stove models to be sold under the program and provides technical guidance. An Operational Committee (OC) consisting representatives from IDCOL and POs sits monthly to discuss implementation status and operational issues under the program. IDCOL adopted a cluster-based approach for program implementation where each Upazila (Subdistrict) consists of a cluster and preferably only one PO working in a particular cluster.</p> <p>The audit team has conducted interviews with the CME and the World Bank to confirm the structure of the CME and the overall implementation of the PoA. The list of the Partner Organizations have also been checked. Also the proceedings of the technical committee meeting have been checked.</p>
Findings	No CAR/CL has been raised.
Conclusion	TUV SUD confirms that the implementation and operation of the registered CDM PoA have been conducted in accordance with the description contained in the registered PoA-DD in line with CDM VVS PoA v2.0.

E.2.2. Implementation and operation of the management system

Means of verification	<p>The following key responsibilities have been performed by the CME IDCOL</p> <ul style="list-style-type: none"> • General management and financing of the PoA; • Identification of CPA implementers and selection and preparation of CPAs for their inclusion in the PoA, ensuring that any CPAs under the PoA are neither registered as an individual CDM project activity nor included in another registered PoA • Establishing CER ownership agreements with the CPA implementer; • Ensuring that the CPA implementer have CER transfer agreements with each local partner • Managing the database for calculating ERs based on data received from the CPA implementer; and • Assessment of competency of entities (external consultant/partner, if any) involved in CPA inclusions as well as ensure that project documents are technically reviewed (either internally or externally outsourced) • Training and capacity development of POs and maintaining training records. <p>The above have been assessed by the audit team by means of checking the management manual, database records, details of trainings provided, agreements with the partner organizations and user agreements</p>
Findings	No CAR/CL has been raised.
Conclusion	TUV SUD confirms that the implementation and operation of the registered CDM PoA have been conducted in accordance with the description contained in the registered PoA-DD in line with CDM VVS PoA v2.0.

E.2.3. Post-registration changes

E.2.3.1. Corrections

Not Applicable.

E.2.3.2. Inclusion of a monitoring plan

Not Applicable

E.2.3.3. Permanent changes to the registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines, or other methodological regulatory documents

Not Applicable

E.2.3.4. Changes to the programme design

Not Applicable

E.2.3.5. Addition of CPA inclusion template

Not Applicable

E.2.3.6. Change of coordination/managing entity

Not Applicable

E.2.3.7. Changes specific to afforestation and reforestation activities

Not Applicable

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

Means of verification	<p>The CPA involves commercial dissemination of 598,906 high efficiency biomass fired cook stoves (ICS) to replace the traditional inefficient cook-stoves in Bangladesh until first monitoring period. The CPAs are located within the boundary of Bangladesh. Specifically, the CPAs are spread over the districts within Bangladesh.</p> <p>The ICS installation database has been checked by the audit team and the records of the user agreements, Partner Organizations have been checked. The DOE has also conducted the acceptance sampling where the team has checked the installation and operation of ICS on a sampling basis.</p>
Findings	No CAR/CL has been raised.
Conclusion	TUV SUD confirms that the implementation of the registered CDM CPA have been conducted in accordance with the description contained in the included CPA-DD in line with CDM VVS PoA v2.0.

E.3.2. Post-registration changes**E.3.2.1. Temporary deviations from the registered monitoring plan, applied methodologies, standardized baselines or other methodological regulatory documents**

Not Applicable

E.3.2.2. Corrections

Not Applicable

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

Not Applicable

E.3.2.4. Inclusion of a monitoring plan

Not Applicable

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

Not Applicable

E.3.2.6. Changes to the project design

Not Applicable

E.3.2.7. Changes specific to afforestation and reforestation activities

Not Applicable

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

Means of verification	The monitoring plan has been checked against the requirements of the methodology AMS II.G ver.10. The monitoring of the parameters and the default values taken have also been assessed.
Findings	CL1 has been raised to clarify which method has been used to monitor the parameter μy in the MR as per the methodology AMS IIG ver.10. The PP has revised the MR accordingly.
Conclusion	TUV SUD confirms that the registered monitoring plan is in accordance with the applied methodologies including applicable tools in line with CDM VVS PoA v2.0.

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	<p>The data and parameters fixed ex ante have been checked from the CPA-DD, approved methodology and IPCC.</p> <ol style="list-style-type: none"> 1. Annual quantity of woody biomass that would have been used per person in the household in the absence of the project activity to generate useful thermal energy equivalent to that provided by the project devices- Default value of 0.5 specified by the methodology AMS II.G ver.10 has been used. 2. Average number of persons served per household prior to project implementation- Value of 4.48 has been checked from Statistical Year Book Bangladesh 2017. 3. Annual quantity of woody biomass that would have been used in the household in the absence of the project activity to generate useful thermal energy equivalent to that provided by the project devices- Value of 2.24 tonnes/household/year has been taken from the baseline survey data 4. Fraction of woody biomass saved by the project activity during year y that can be established as non-renewable biomass- Value of 0.843 has been calculated as per TOOL30: Calculation of the fraction of non-renewable biomass" 5. Emission factor for the fossil fuels projected to be used for substitution of non-renewable woody biomass by similar consumers- Value of 63.7 tCO₂e/TJ as specified by the methodology AMS II.G ver.10 has been used. 6. Net calorific value of the non-renewable woody biomass that is substituted- Value of 0.0156 TJ/tonne as specified by the methodology AMS II.G ver.10 has been used.
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	<p>7. Efficiency of the old devices being replaced by project devices of type i and batch j- Value of 0.11 weighted average efficiency of 11% with a 90:10 mix has been considered as per methodology AMS II.G ver.10</p> <p>8. Net to gross adjustment factor- Value of 0.95 as specified by the methodology AMS II.G ver.10 has been used.</p>
Findings	No CL/CAR has been raised
Conclusion	TÜV SÜD confirms that the values fixed ex ante are in line with the requirements of CDM VVS PoA v2.0

E.3.4.2. Data and parameters monitored

Means of verification	The verification of the parameters required by the monitoring plan is provided as follows:	
	Data / Parameter:	$N_{y,i,j}$
	Data unit:	Number
	Description:	Number of project devices of type i and batch j operating during year y
	Source of data used:	IDCOL ICS installation database
	Means of verification/Comments:	<p>The number of stoves installed during the vintages 2018, 2019 and 2020 with Tier 2 and Tier 3 have been verified from the ICS installation database which provides the complete list of the stoves installed during each year. The type of stoves is defined as per the PoA-DD.</p> <p>The CPA implementer is maintaining database of all the ICS installed in the CPA. A usage monitoring survey was conducted in September 2020 to determine the number of operating stoves of type i and batch j on a sampling basis. A 95 /10 confidence / margin of error is applied for the sampling parameter as per para 22 of Standard: Sampling and surveys for CDM project activities and programmes of activities, Version 08.0.</p> <p>Every individual project stove in the CPA covered under this MR (observed to be uniquely identifiable by its ID number) was allocated a sample number. CME has submitted sample size calculation spreadsheet and random number generator where it was demonstrated that samples are drawn randomly using stratified random sampling approach. DOE further has cross-checked the sampling approach by the CME as per MR against related PoA-DD and CPA-DD.</p>

	<p>Additionally, the related population size has been checked with corresponding supporting documents (e.g. Total ICS database, ER worksheet). 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 standard.</p> <p>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 was found to meet the minimum desired confidence and precision levels.</p>													
	<table border="1"> <tr> <td>Cross-check</td><td>This has been cross-checked with the contract agreements with the beneficiaries</td></tr> </table>	Cross-check	This has been cross-checked with the contract agreements with the beneficiaries											
Cross-check	This has been cross-checked with the contract agreements with the beneficiaries													
	<table border="1"> <tr> <td>Data / Parameter:</td><td>μ_y</td></tr> <tr> <td>Data unit:</td><td>Fraction</td></tr> <tr> <td>Description:</td><td>Adjustment to account for any continued use of pre-project devices during the year y</td></tr> <tr> <td>Source of data used:</td><td>Monitoring Survey results</td></tr> <tr> <td>Means of verification/Comments:</td><td>Based on the monitoring survey results, it has been verified that no baseline stoves are in use during the monitoring period. Also as per the DOE sampling of the sampled households, no baseline stove was found to be used. Hence as per the methodology AMS II.G version 10, option1 has been used and the value has been taken as 1.0.</td></tr> <tr> <td>Cross-check</td><td>DOE sampling</td></tr> </table>	Data / Parameter:	μ_y	Data unit:	Fraction	Description:	Adjustment to account for any continued use of pre-project devices during the year y	Source of data used:	Monitoring Survey results	Means of verification/Comments:	Based on the monitoring survey results, it has been verified that no baseline stoves are in use during the monitoring period. Also as per the DOE sampling of the sampled households, no baseline stove was found to be used. Hence as per the methodology AMS II.G version 10, option1 has been used and the value has been taken as 1.0.	Cross-check	DOE sampling	
Data / Parameter:	μ_y													
Data unit:	Fraction													
Description:	Adjustment to account for any continued use of pre-project devices during the year y													
Source of data used:	Monitoring Survey results													
Means of verification/Comments:	Based on the monitoring survey results, it has been verified that no baseline stoves are in use during the monitoring period. Also as per the DOE sampling of the sampled households, no baseline stove was found to be used. Hence as per the methodology AMS II.G version 10, option1 has been used and the value has been taken as 1.0.													
Cross-check	DOE sampling													
	<table border="1"> <tr> <td>Data / Parameter:</td><td>$\eta_{new,i,j}$</td></tr> <tr> <td>Data unit:</td><td>Fraction</td></tr> <tr> <td>Description:</td><td>Efficiency of the device of each type i and batch j implemented as part of the project activity</td></tr> <tr> <td>Source of data used:</td><td>WBT test reports</td></tr> <tr> <td>Means of verification/Comments:</td><td>The efficiency of the stoves of Tier 2 and Tier 3 installed in the years 2018, 2019 and 2020 have been measured based on Water Boiling Tests (WBT) conducted per each vintage. WBT tests have been conducted for a total of 51 nos of stoves, 17 in each vintage. Based on the paragraph 32 of AMS II.G. version-10, the account for loss in efficiency of the project devices has been calculated.</td></tr> </table>	Data / Parameter:	$\eta_{new,i,j}$	Data unit:	Fraction	Description:	Efficiency of the device of each type i and batch j implemented as part of the project activity	Source of data used:	WBT test reports	Means of verification/Comments:	The efficiency of the stoves of Tier 2 and Tier 3 installed in the years 2018, 2019 and 2020 have been measured based on Water Boiling Tests (WBT) conducted per each vintage. WBT tests have been conducted for a total of 51 nos of stoves, 17 in each vintage. Based on the paragraph 32 of AMS II.G. version-10, the account for loss in efficiency of the project devices has been calculated.			
Data / Parameter:	$\eta_{new,i,j}$													
Data unit:	Fraction													
Description:	Efficiency of the device of each type i and batch j implemented as part of the project activity													
Source of data used:	WBT test reports													
Means of verification/Comments:	The efficiency of the stoves of Tier 2 and Tier 3 installed in the years 2018, 2019 and 2020 have been measured based on Water Boiling Tests (WBT) conducted per each vintage. WBT tests have been conducted for a total of 51 nos of stoves, 17 in each vintage. Based on the paragraph 32 of AMS II.G. version-10, the account for loss in efficiency of the project devices has been calculated.													

The WBT test has been conducted by the CME on 51 nos. of stoves to meet the sampling requirement of monitoring plan of the project activity.

Sampling has been conducted Vintage and Tier wise for the WBT for

$\eta_{\text{new},i,j}$ Efficiency of the device of each type i and batch j implemented as part of the project activity.

Samples covered during monitoring- Vintage 2018

Tier (i)	Stove Type	Sampling frame size	Monitored Sample Size
Tier 2	Single Mouth 10" with Insulation and Lining	1189	3
Tier 3	Single Mouth 8" Portable with Insulation and Lining	58836	8
Tier 3	Double mouth (9" & 8") with Insulation and Lining	1335	3
Tier 3	Double mouth (10" & 9") with Insulation and Lining	278	3

Samples covered during monitoring- Vintage 2019

Tier (i)	Stove Type	Sampling frame size	Monitored Sample Size
Tier 2	Single Mouth 10" with Insulation and Lining	8289	3
Tier 3	Single Mouth 8" Portable with Insulation and Lining	284898	8
Tier 3	Double mouth (9" & 8") with Insulation and Lining	4612	3
Tier 3	Double mouth (10" & 9") with Insulation and Lining	808	3

Samples covered during monitoring- Vintage 2020

Tier (i)	Stove Type	Sampling frame size	Monitored Sample Size
Tier 2	Single Mouth 10" with Insulation and Lining	6098	3
Tier 3	Single Mouth 8" Portable with Insulation and Lining	229272	8
Tier 3	Double mouth (9" & 8") with Insulation and Lining	3129	2

		Tier 3	Double mouth (10" & 9") with Insulation and Lining	162	4
	<p>The sampling test of stoves by such certification bodies/agents or manufacturers conducted following a 95/10 precision in accordance with the "Standard for sampling and surveys for CDM project activities and programme of activities".</p> <p>The audit team has verified the WBT test reports and the calculations to confirm the data and the precision level achieved during the sampling.</p>				
	Cross-check	--			

Data / Parameter:	Date of commissioning of project device i
Data unit:	Date
Description:	Actual date of commissioning of the project device
Source of data used:	ICS installation database
Means of verification/Comments:	The date of commissioning of stoves during 2018-2020 has been verified from the ICS installation database. Date of installation of each of the stove has been provided in the database. The audit team confirms that the total number of installed stoves is consistent with the database.
Cross-check	--

Findings	<p>CL1 has been raised to clarify which method has been used to monitor the parameter μy in the MR as per the methodology AMS IIG ver.10.</p> <p>CAR 1 has been raised to know whether the equipment were externally calibrated or newly purchased during the current monitoring period and the total number of samples conducted for efficiency testing.</p> <p>The CME has provided clarification on the chosen method to determine μy in the MR and accordingly revised the MR to close out the issues.</p>
Conclusion	<p>The monitoring has been carried out in accordance with the monitoring plan contained in the registered PoA-DD. All parameters were monitored and determined as per the registered monitoring plan. Referring to the VVS PoA v2.0, DOE confirms through on-site verification and from the document review, the actual monitoring system complies with the registered monitoring plan. The substantiation of this conformity on information flow for these parameters including the values in the monitoring reports is reported in the above</p> <p>During the verification, all relevant monitoring parameters of the registered monitoring plan have been verified with regard to the appropriateness of the verification method, the correctness of the values applied for ER calculation, the accuracy and applied QA/QC measures. After appropriate corrections, carried out by the project participant, it is confirmed that all monitoring parameters have been measured / determined without material misstatements and are in line with all applicable standards and relevant requirements.</p> <p>All parameters required to be monitored are recorded at the intervals required by the registered monitoring plan and the applied methodology. On the basis of review</p>

of source and nature of available evidences and records, the verification team confirms the quality of evidence for emission reduction provided is sufficient as per VVS PoA v2.0.

E.3.4.3. Implementation of sampling plan

Means of verification

A single sampling plan covering all specific-case CPAs covered in this monitoring report has been undertaken to estimate parameter values, as per the PoA-DD.

The number of units installed under CPA are as follows:

Tier	Stove	2018	2019	2020
Tier 2	Single Mouth 10" with Insulation and Lining	1189	8289	6098
Tier 3	Single Mouth 8" Portable with Insulation and Lining	58836	284898	229272
Tier 3	Double mouth (9" & 8") with Insulation and Lining	1335	4612	3129
Tier 3	Double mouth (10" & 9") with Insulation and Lining	278	808	162

The Sampling plan has been verified as per the PoA-DD description and also as per the Sampling and surveys for CDM project activities and programmes of activities, Version 08.

The CME has employed stratified random sampling technique for the above classification of the stoves and thus categorised into applicable sampling strata for identifying samples for various monitoring parameters, as applicable. The sample size was calculated as per section B.5 of the registered CPA-DD at 95% confidence level.

The WBT test has been conducted by the CME on 51 nos. of stoves to meet the sampling requirement of monitoring plan of the project activity. Sampling has been conducted Vintage and Tier wise for the WBT for

$\eta_{new,ij}$ Efficiency of the device of each type i and batch j implemented as part of the project activity.

Samples covered during monitoring- Vintage 2018

Tier (i)	Stove Type	Sampling frame size	Monitored Sample Size
Tier 2	Single Mouth 10" with Insulation and Lining	1189	3
Tier 3	Single Mouth 8" Portable with Insulation and Lining	58836	8
Tier 3	Double mouth (9" & 8") with Insulation and Lining	1335	3

Tier 3	Double mouth (10" & 9") with Insulation and Lining	278	3
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Samples covered during monitoring- Vintage 2019

Tier (i)	Stove Type	Sampling frame size	Monitored Sample Size
Tier 2	Single Mouth 10" with Insulation and Lining	8289	3
Tier 3	Single Mouth 8" Portable with Insulation and Lining	284898	8
Tier 3	Double mouth (9" & 8") with Insulation and Lining	4612	3
Tier 3	Double mouth (10" & 9") with Insulation and Lining	808	3

Samples covered during monitoring- Vintage 2020

Tier (i)	Stove Type	Sampling frame size	Monitored Sample Size
Tier 2	Single Mouth 10" with Insulation and Lining	6098	3
Tier 3	Single Mouth 8" Portable with Insulation and Lining	229272	8
Tier 3	Double mouth (9" & 8") with Insulation and Lining	3129	2
Tier 3	Double mouth (10" & 9") with Insulation and Lining	162	4

Sampling for the number of stoves operating- A total of 100 stoves have been sampled by the CME across all the type and model year wise.

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

Stove Type	Year	Stove Model	Stove population	Monitored Sample size
Tier 2	2018	Single Mouth 10" with Insulation and Lining	1189	21
Tier 3	2018	Single Mouth 8" Portable with Insulation and Lining	58836	12
Tier 3	2018	Double mouth (9" & 8") with Insulation and Lining	1335	2
Tier 3	2018	Double mouth (10" & 9") with Insulation and Lining	278	1
Tier 2	2019	Single Mouth 10" with Insulation and Lining	8289	16
Tier 3	2019	Single Mouth 8" Portable with	284898	23

		Insulation and Lining		
Tier 3	2019	Double mouth (9" & 8") with Insulation and Lining	4612	5
Tier 3	2019	Double mouth (10" & 9") with Insulation and Lining	808	3
Tier 2	2020	Single Mouth 10" with Insulation and Lining	6098	5
Tier 3	2020	Single Mouth 8" Portable with Insulation and Lining	229272	9
Tier 3	2020	Double mouth (9" & 8") with Insulation and Lining	3129	2
Tier 3	2020	Double mouth (10" & 9") with Insulation and Lining	162	1

Sample size calculation is assessed to be in accordance with registered sampling plan in PoA-DD/CPA-DD and Sampling and surveys for CDM project activities and programmes of activities for sampling.

Every individual project stove in the CPA covered under this MR (observed to be uniquely identifiable by its ID number) was allocated a sample number. CME has submitted sample size calculation spreadsheet and random number generator where it was demonstrated that samples are drawn randomly using stratified random sampling approach. DOE further has cross-checked the sampling approach by the CME as per MR against related PoA-DD and CPA-DD. Additionally, the related population size has been checked with corresponding supporting documents (e.g. Total ICS database, ER worksheet). 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 standard.

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 was found to meet the minimum desired confidence and precision levels.

A total of 100 samples have been done although the total sample size required is 43 as per the sample size calculation. Hence the Sampling has been conducted in line with the PoA-DD, CPA-DD and the Sampling standard.

Findings	No CAR/CL has been raised.
Conclusion	The DOE confirms that the sampling plan has been implemented by the CME in line with Sampling and surveys for CDM project activities and programmes of activities, Version 08.0.

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

Means of verification	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 year test conducted). All the relevant equipment including thermometer, moisture meters, weighing scale and sensors were duly purchased. The CME has submitted all purchase receipts during the remote verification audit for all the relevant tools and equipment /CAL/. Test conducted were also verified to be in line with WBT protocol requirement.
Findings	No CAR/CL has been raised.
Conclusion	The audit team confirms that the CME has calibrated all the measuring equipment used in the CPA and in line with the requirements of CDM VVS PoA v2.0.

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	Baseline emissions are calculated based on the baseline emission due to Quantity of woody biomass that is saved in tonnes per cookstove device of type <i>i</i> and batch <i>j</i> during year <i>y</i> . and Annual quantity of woody biomass that would have been used in the absence of the project activity to generate useful thermal energy equivalent to that provided by the project device type <i>i</i> and batch The emissions are calculated as per the methodology AMS II.G ver.10 and the calculations have been checked by the audit team from the ER spreadsheet in detail.
Findings	CAR 2 and CAR 3 have been raised, since there is a mismatch of data of the installed stoves between database and ER sheet. Also, there is a mismatch in the values of monitoring efficiency between the spreadsheets- "Sample size cal" and "ER calculation". The values do not present an average of the efficiency in the calculation sheet. The PP has corrected the ER calculations accordingly.
Conclusion	TUV SUD confirms that the calculations, applied formulae and method for calculation of baseline emissions are in accordance with the registered monitoring plan and are in line with the requirements of the applied methodology and CDM VVS PoA v2.0.

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

Means of verification	Not applicable
Findings	Not applicable
Conclusion	Not applicable

E.3.6.3. Calculation of leakage GHG emissions

Means of verification	Not applicable
Findings	Not applicable
Conclusion	Not applicable

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

Means of verification	<p>The Emission reduction calculations have been checked from the data, default values, baseline emissions data. The calculations have been checked from the ER spreadsheet in detail.</p> <p>Verified emission reductions in this monitoring period: 456,395 tCO₂e</p> <p>Baseline: 456,395 tCO₂e Project emissions: 0 tCO₂e Leakage: 0 tCO₂e</p>
Findings	<p>CAR 2 and CAR 3 have been raised, since there is a mismatch of data of the installed stoves between database and ER sheet. Also there is a mismatch in the values of monitoring efficiency between the spreadsheets- "Sample size cal" and "ER calculation". The values do not present an average of the efficiency in the calculation sheet.</p> <p>The PP has corrected the ER calculations accordingly.</p>
Conclusion	<p>No lack of evidence and missing data were detected during this monitoring period. All values as per the monitoring plan were crosschecked by the verification team against basic monitored data and the calculations were found to be correct. The verification team confirms that all assumptions, emission factors and default values have been correctly justified. All the emission factors, application of maximum permissible errors and default values are explicitly mentioned in the monitoring report. Hence the DOE confirms that the methods and formulae used to obtain the emissions are appropriate.</p> <p>No reporting risks have been identified for the data reported. Troubleshooting procedure, maintenance and calibration of monitoring equipment, monitoring measurements and reporting, record handling and maintenance, reviewing monitored data are available with the CME. All the monitored data are archived in form. The data will be kept for the whole crediting period and 2 years after the last crediting period thereby meeting the requirement of the monitoring plan</p> <p>The verification team confirms that the emission reductions are real and measurable. The verification team also confirms that there is no material misstatement in the calculation of reported emission reductions. The calculations of baseline emissions, project emissions and leakage as appropriate have been carried out in accordance with the formulae and methods described in the registered monitoring plan and the applied methodology document.</p>

	<p>TUV SUD confirms that all assumptions, emission factors and default values have been correctly justified. All the emission factors and default values are explicitly mentioned in the monitoring report.</p> <p>Calculations, applied formulae and method for calculation of GHG emission are in accordance with the registered monitoring plan and are in line with the requirements of the applied methodology</p>
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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
10512-P1-0001-CP1 IDCOL Improved Cook Stove Program – CPA 01	456,395	0	0	0	456,395	456,395
Total	456,395	0	0	0	456,395	456,395

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

Means of verification	Amount of GHG emission reduction achieved during this monitoring period is less than the amount estimated ex ante for this monitoring period in the CPA-DD
Findings	No CAR/CL has been raised.
Conclusion	TUV SUD confirms that the emission reductions are real and measurable.

Title and UNFCCC reference number of the CPA	Actual values achieved by the CPAs during this monitoring period	Value estimated in ex ante calculation in the included CPA-DD(s)
10512-P1-0001-CP1 IDCOL Improved Cook Stove Program – CPA 01	456,395	805,691
Total	456,395	805,691

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

Means of verification	Amount of GHG emission reduction achieved during this monitoring period is less than the amount estimated ex ante for this monitoring period in the CPA-DD
Findings	No CAR/CL has been raised.
Conclusion	TUV SUD confirms that the emission reductions are real and measurable.

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

Means of verification	Not applicable
Findings	Not applicable

Conclusion	Not applicable
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E.3.8. Global stakeholder consultation

Means of verification	No comments were received during Global stakeholder consultation
Findings	Not applicable
Conclusion	Not applicable

SECTION F. Internal quality control

Internal quality control within the team is assured by means of a technical review process that takes place after the on-site assessment and after closure of findings. The internal quality control in the verification process is given by the final decision (Verification and Certification Conclusion) made by the CB "Environment and Energy".

SECTION G. Verification opinion

The DOE confirms that

- the development and maintenance of records and reporting procedures are in accordance with the registered monitoring plan;
- the PoA is operated as planned and described in the PoA-DD approved by the EB;
- the CPA is implemented and operated as planned and described in the CPA-DD
- the monitoring system is in place and generates GHG emission reductions data;
- the monitoring plan in Monitoring Report is as per the PoA-DD and monitoring plan approved by the EB;
- the approved monitoring plan in the approved PDD is as per the applied methodology;
- There is an audit trail that contains the evidence and records that validate the stated figures.

Based on the information we have seen and evaluated, we confirm that the PoA achieved the verified amount of reductions in anthropogenic emissions by sources of greenhouse gases that would not have occurred in the absence of the project activity.

Verified emission reductions in this monitoring period: 456,395 tCO₂e

Baseline:	456,395 tCO ₂ e
Project emissions:	0 tCO ₂ e
Leakage:	0 tCO ₂ e

SECTION H. Certification statement

TÜV SÜD South Asia Pvt. Ltd. Has performed the Verification of CDM CPA 10512-P1-0001-CP1 IDCOL Improved Cook Stove Program – CPA 01. The verification is based on the currently valid documentation of the United Nations Framework Convention on Climate Change (UNFCCC).

The management of IDCOL is responsible for the preparation of the GHG emissions data and the reported GHG emission reductions on the basis set out within the project's Monitoring Plan indicated in the registered PDD and the applied methodology.

TUV SUD conducted the verification on the basis of the monitoring methodology "AMS II.G ver. 10, CPA-DD, validation report and the monitoring report, emission reduction spreadsheets and all the supporting documentation made available to us.

TÜV SÜD confirms that the project is implemented as described in the validated and registered project design documents. Based on the information we have assessed, we confirm that the GHG emission reductions are calculated without material misstatements in a conservative and appropriate manner.

Pune, 26/12/2020



Milind Shende

Manager, Certification Body
TÜV SÜD South Asia Private Limited

Appendix 1. Abbreviations

Abbreviations	Full texts
AQL	Acceptable Quality Level
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CDM-EB	CDM Executive Board
CER	Certified Emission Reduction
CMP	Conference of the Parties serving as the Meeting of the Parties to the Kyoto Protocol
CME	Coordinating and Managing Entity
CO ₂ e	Carbon dioxide equivalent
CR / CL	Clarification Request
CPA	Component Project Activity
DNA	Designated National Authority
DOE	Designated Operational Entity
EF	Emission Factor
ER	Emission Reduction
FAR	Forward Action Request
GHG	Greenhouse Gas(es)
GWP	Global Warming Potential
IDCOL	Infrastructure Development Company Limited
ICS	Improved Cook Stoves
KP	Kyoto Protocol
MP	Monitoring Plan
MR	Monitoring Report
PCP	Project Cycle Procedure
PDD	Project Design Document
PoA	Programme of Activities
PP	Project Participant
TÜV SÜD	TÜV SÜD South Asia Pvt. Ltd
UNFCCC	United Nations Framework Convention on Climate Change
UQL	Unacceptable Quality Level
WBT	Water Boiling Test
VVS	Clean Development Mechanism Validation And Verification Standard for PoA v2.0

Appendix 2. Competence of team members and technical reviewers



CERTIFICATE OF APPOINTMENT

Mr. Murty, Eswar fulfils the requirements of the Certification Body 'Environment and Energy' of TÜV SÜD South Asia Pvt Ltd to participate in audits.

Qualification applicable to					
Standard	CDM	GS	VCS	ISO-14034-1:2006	Other
	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Qualifications						
Status	Validator	Verifier	ATL	Technical Reviewer	Financial Expert	Technical Expert
	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
TA (s)	1.1, 1.2, 3.1, 4.1, 13.1					

Country Expertise						
Region	1	2	3	4	5	Other
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Further countries						

Technical Area	
1.1_Thermal Energy Generation	
1.2_Renewables	
3.1_Energy demand	
4.1_Cement and lime production	
13.1_Solid waste and wastewater	

This appointment is valid until 31.05.2021 and is bound by internal requirements of the Certification Body 'Environment and Energy' of TÜV SÜD South Asia Pvt Ltd.

In case of loss of validity of this certificate as per result of an assessment according to internal procedures or due to any other reason, it will be properly communicated to you.

Your Certificate has the internal reference no. CR-IND-CCP-0031/011.

Date	Signature
01/08/2020	

IS-CMS-CB-POG-01/06, version 03

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CERTIFICATE OF APPOINTMENT

Mr. Meesa, Srikanth fulfils the requirements of the Certification Body 'Environment and Energy' of TÜV SÜD South Asia Pvt Ltd to participate in audits.

Standard	Qualification applicable to				
	CDM	GS	VCS	ISO-14064-1:2006	Other
	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Status	Qualification as					
	Validator	Verifier	ATL	Technical Reviewer	Financial Expert	Technical Expert
	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
TA (s)	1,2, 3.1, 7.1, 13.1					

Region	Country Expertise					Other
	1	2	3	4	5	
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Further countries						

Technical Area
1.2_Renewables
3.1_Energy demand
7.1_Transport
13.1_Solid waste and wastewater

This appointment is valid until 31.05.2021 and is bound by internal requirements of the Certification Body 'Environment and Energy' of TÜV SÜD South Asia Pvt Ltd.

In case of loss of validity of this certificate as per result of an assessment according to internal procedures or due to any other reason, it will be properly communicated to you.

Your Certificate has the internal reference no. CB-IND-CCP-0096/007.

Date	Signature
01/06/2020	

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CERTIFICATE OF APPOINTMENT

Mr. A.Z.M. Humayon Kabir fulfills the requirements as per the Evaluation and Qualification criteria (IS-CMS-CB-POG-01/01) of the Certification Body 'Environment and Energy' of TÜV SÜD South Asia Pvt Ltd and is appointed as a

Country Expert- Bangladesh

This appointment as a Country Expert is for his involvement in projects related to CDM, GS and VCS Standards.

This appointment is valid until 19.10.2021 and is bound by internal requirements of the Certification Body 'Environment and Energy' of TÜV SÜD South Asia Pvt Ltd.

Your Certificate has the internal reference no. CB-IND-CCP-CE-04/01.

Date	Signature
20/10/2020	

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Appendix 3. Documents reviewed or referenced

No.	Author	Title	References to the document	Provider
1	UNFCCC	https://cdm.unfccc.int/ProgrammeOfActivities/poa_db/TDF17CHYRMOLQ368IJN9GZE2S4UB5A/view https://cdm.unfccc.int/ProgrammeOfActivities/cpa_db/QGL50KH31F479EMBJ6D82RTAWPSVNI/view CPA 10512-P1-0001-CP1: IDCOL Improved Cook Stove Program – CPA 01	PoA 10512	Others
2	UNFCCC	AMS-II.G. ver. 10 Energy efficiency measures in thermal applications of non-renewable biomass	Version 10	Others
3	UNFCCC	Sampling and surveys for CDM project activities and programmes of activities	Version 8.0	Others
4	IDCOL	Published Monitoring Report	Version.1 19/10/2020	CME
5	IDCOL	Registered PoA-DD	Version 03 17/09/2019	CME
6	IDCOL	Final Monitoring Report	Version 4 24/12/2020	CME
7	IDCOL	ER Calculation spreadsheet	Version.1 19/10/2020	CME
8	IDCOL	ER Calculation spreadsheet	Version 03 22/12/2020	CME
9	IDCOL	ICS Database	16/09/2018 - 31/08/2020	CME
10	IDCOL	Participation agreement between IDCOL and Partner Organizations		CME
11	IDCOL	Minutes of meeting of Technical Committee of IDCOL Improved cook stove programme	10/02/2020 23/06/2020	CME
12	IDCOL	Sample Inspection forms for IDCOL		CME
13	IDCOL	User agreements		CME
14	IDCOL	List of Partner Organizations included in CPA-01		CME
15	IDCOL	Approval for conducting Water Boiling Tests for ICS	13/09/2020	CME
16	IDCOL	Training records and photographs conducted for management and staff	2019-20	CME
17	IDCOL	Awareness and Community mobilization trainings conducted for ICS	2019-20	CME
18		Calibration certificates for Thermometer and Moisture meter		CME

CDM-PoA-VCR-FORM

19	IDCOL	Details of Equipment- Digital Thermometer and Moisture meter and Weighing scale		CME
20	Bangladesh Bureau of Statistics	Statistical Year Book Bangladesh, 37th Edition	2017	Others
21	UNFCCC	TOOL30: Calculation of the fraction of non-renewable biomass"		Others
22	IDCOL	CER delivery commitment to buyer	03/02/2020	CME

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

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

NA

Table 2. CLs from this verification

CL ID	01	Section no.	E.2	Date:	28/11/2020
Description of CL					
PP to clarify which method has been used to monitor the parameter μy in the MR as per the methodology AMS IIG ver.10.					
CME response				Date:	05/12/2020
PP has been used method 1 of the methodology to monitor the parameter μy of the project activity and same has been clarified in the MR.					
Documentation provided by the CME					
Monitoring Report (version 02)					
DOE assessment				Date:	12/12/2020
PP has mentioned the method to carry out the monitoring of the parameter μy in the MR as per the methodology. Hence the issue is closed.					

Table 3. CARs from this verification

CAR ID	01	Section no.	E.2	Date:	28/11/2020
Description of CAR					
For parameter new,i,j , PP to explain					
<ol style="list-style-type: none"> Whether the equipment were externally calibrated or newly purchased during the current monitoring period How many total number of samples were taken? 					
CME response				Date:	05/12/2020
<ol style="list-style-type: none"> Equipment used to conduct water boiling test are newly purchased during the current monitoring period. Purchase order of new equipment's has been submitted to DOE for review and also it has been clarified in the MR. WBT test has been conducted on 51 stoves to meet the sampling nos. requirement of the monitoring plan. This has been clarified in ER and MR sheet of the project activity. 					
Documentation provided by the CME					
<ul style="list-style-type: none"> Monitoring Report (Version 02) Purchase order of equipment 					
DOE assessment				Date:	12/12/2020
The CME has submitted the Purchase order for conducting the WBT tests for 51 stoves, during the monitoring period and the same has been checked and confirmed by the audit team. Hence the issue is closed.					

CAR ID	02	Section no.	MR, ER sheet	Date:	28/11/2020
Description of CAR					

The total number of stoves installed is not matching with the installation database. The MR and the ER calculation sheets need to be revised accordingly.	
CME response	Date: 05/12/2020
Stoves installed nos. have been corrected in line with installation database and accordingly necessary correction has been done in ER and MR sheet.	
Documentation provided by the CME	
<ul style="list-style-type: none"> Monitoring Report (Version 02) Installation database 	
DOE assessment	Date: DD/MM/YYYY
The number has been corrected in the MR in line with the database for installation of stoves. Hence the issue is closed.	

CAR ID	03	Section no.	ER sheet	Date: 28/11/2020
Description of CAR				
In the ER calculation sheet, there is a mismatch in the values of monitoring efficiency between the spreadsheets- "Sample size cal" and "ER calculation". The values do not present an average of the efficiency from row 41 to 52 in the sheet " ER calculation"				
CME response				Date: 05/12/2020
The efficiency values have been corrected in ER calculation sheet.				
Documentation provided by the CME				
Revised ER calculation spreadsheet				
DOE assessment				Date: DD/MM/YYYY
The values of efficiency have now been corrected in the spreadsheets. Hence the issue is closed.				

Table 4. FARs from this verification

NA

Document information

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