



**Component project activity design document form
(Version 09.0)**

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

BASIC INFORMATION

Title of the CPA	Improved cookstove program in Bangladesh supported by the Republic of Korea – CPA 03
Scale of the CPA	☐ Large-scale ☒ Small-scale
Version number of the CPA-DD	3.0
Completion date of the CPA-DD	03/03/2020
Title and UNFCCC reference number of the registered CDM PoA	Improved cookstove program in Bangladesh supported by the Republic of Korea PoA 10431
Title and reference number of the corresponding generic CPA	Improved cookstove program in Bangladesh supported by the Republic of Korea – CPA # Generic CPA 01
Coordinating/managing entity	Ecoeye Co., Ltd.
Host Party	Republic of Bangladesh
Applied methodologies and standardized baselines	AMS II.G. - Small-scale methodology: Energy efficiency measures in thermal applications of non-renewable biomass, version 08.0
Sectoral scopes	3
Estimated amount of annual average GHG emission reductions	2,708,779 tCO ₂ e

SECTION A. Description of component project activity (CPA)**A.1. Purpose and general description of CPA**

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a) Purpose of the CPA

The CPA involves dissemination of high efficiency biomass (wood-fuel) fired ICSs (technology/measure) to replace the existing traditional (wood-fuel) cookstoves/three stone fires in beneficiary households/SMEs in Bangladesh. ECOEYE Co., Ltd., Korea Impact Carbon Corporation and/or other Korean Entity(ies) will provide for all implementation costs for the CPA. ECOEYE Co., Ltd., Korea Impact Carbon Corporation and/or other Korean Entity(ies) will provide subsidy to make ICS affordable to households, as well as for the operation & maintenance costs of ICS production and distribution to CME and CPA implementers, to operate the CPA in a financially sustainable condition.

b) Location the CPA

The CPA is located in Bangladesh.

c) Technology

The CPA is limited to aggregate installation of 2,000,000 number of ICS units. Any ICS units over and above the specified number shall form subsequent CPA(s) under the PoA.

The CPA includes high efficiency wood-fuel ICS that replaces traditional wood-fuel stoves. The project involves two broad ICS types i.e. single pot and double pot stoves. These ICS burn fuel more efficiently and are designed to reduce smoke, PM and other gaseous emissions, thus creating cleaner indoor air for women and children. Due to their higher thermal efficiency relative to traditional stoves, ICS reduce the amount biomass fuel consumption for meeting similar thermal energy needs.

d) Project Boundary

The CPA boundary is limited to Republic of Bangladesh.

e) Baseline scenario

In the absence of the CPA, project households/SMEs would cook primarily using traditional inefficient stoves, perpetuating environmental and health degradation. Biomass accounts for 90% of Bangladeshi households' energy needs with fuelwood being used in around 84% households for cooking purposes (section 1.5, page 8, Country Action Plan for Clean Cookstoves). Also, more than 90% households still use traditional stoves for cooking¹.

f) Annual Average GHG and total GGH reductions over the crediting period

Annual average GHG reductions: 2,708,779 tCO₂e

Total GHG reductions over CP: 27,087,790 tCO₂e

g) Small scale project type

The CPA is a type II category CPA.

A.2. Location of CPA

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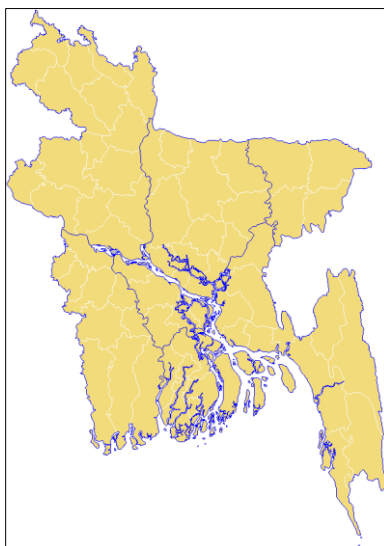
Host Party(ies): Bangladesh

Region/State/Province: All across Bangladesh

City/Town/Community: All across Bangladesh

Physical Geographical location: The geographical locations of Bangladesh is depicted by the map below.

¹ Country Action Plan for Clean Cookstoves, November 2013, Power Division, Ministry of Power, Government of the People's Republic of Bangladesh, page 39



The CPA is located within Bangladesh as can be verified from the ICS installation database. Dhaka is the national capital of Bangladesh. GPS Coordinates of Dhaka is 23°42'37.44"N, 90°24'26.78"E².

A.3. Technologies/measures

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The CPA includes dissemination of high efficiency improved wood-fuel based cooking stoves(technology/measure) for meeting the thermal energy needs of beneficiary households'/SMEs. The ICS will replace traditional inefficient wood-fuel cookstoves. The ICS will be constructed by local partners, trained and acting under a contractual basis, on behalf of the CPA Implementer to install the ICS and offer post installation maintenance services. ICSs are designed to increase heat transfer to the cooking pot, while being suitable for traditional utensils and cooking habits of people in Bangladesh. The improvement in thermal efficiency is achieved by optimizing the dimensions of the ICS combustion chamber and ensuring effective air flow to aid complete combustion of biomass.

There are two types of devices envisaged for implementation under the CPA i.e. one pot stoves and two pot stoves³. For each stove type, the stoves are installed with standard material specifications, but slightly varying dimensions to address various constraints wrt to kitchen size, location, orientation etc. The population for one type of stove is deemed homogeneous (across various sizes) as they all cater to domestic / SME usage level and have similar specifications.

Description	One Pot Bondhu Chulha	Two Pot Bondhu Chulha
Thermal efficiency	34.00%	34.62%
Design Operational Lifetime ⁴	5-7 years	5-7 years
Service Level	Domestic/SME	Domestic/SME

The CPA hasn't started yet. It is expected to start on 15/03/2020. The proposed implementation plan⁵ of the CPA is as follows:

Year 1: 1,000,000 units

² <https://latitudelongitude.org/bd/dhaka/>

³ Other ICS models may be subsequently added to the CPA (over the crediting period) depending on the changing market demand and user feedback (Subject to their compliance with eligibility criteria for inclusion of CPA in the PoA and methodology applicability)

⁴ As the design operational life span of project devices is less than the crediting period (10 year fixed), hence, either these devices will be replaced after the end of their expected operational life span or otherwise, emission reductions will be claimed only till the life span of the project devices.

⁵ The actual implementation may vary ex-post subject to external factors and ICS demand within the CPA boundary. However, the CPA shall be limited to an aggregate installation of 2,000,000 ICS units.

Year 2: 2,000,000 units

In the absence of this PoA households/SMEs would cook primarily using traditional inefficient stoves (open fire/ three stone fire / traditional clay stoves), perpetuating environmental and health degradation. Thus, replacement of traditional stoves by ICS reduces non-renewable biomass fuel consumption and hence equivalent amount of GHG emissions.

A.4. Coordinating/managing entity

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Ecoeye Co., Ltd.

A.5. Parties and CPA implementers

Parties involved	CPA implementers	Indicate if the Party involved wishes to be considered as CPA implementer (Yes/No)
Republic of Bangladesh	Bangladesh Bondhu Foundation (Private)	No

A.6. Public funding of CPA

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No public funding is involved in the CPA.

A.7. History of CPA

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The proposed CPA is neither registered as a CDM project activity nor included in another registered CDM PoA.

The proposed CPA is not a deregistered project activity.

The proposed CPA is not a CPA that has been excluded from a registered CDM PoA.

The assessment of former project activities in the proposed CPA boundary is as follows:

CDM Reference	Project Title	Methodology Applied
78	Landfill Gas Extraction and Utilization at the Matuail landfill site, Dhaka, Bangladesh	ACM0001, ACM0002 ver. 2
169	Composting of Organic Waste in Dhaka	AM0025
5125	Improving Kiln Efficiency in the Brick Making Industry in Bangladesh	AMS-II.D. ver. 12
6085	Improving Kiln Efficiency in the Brick Making Industry in Bangladesh (Bundle-2)	AMS-II.D. ver. 12
10087	Akij Particle Biomass Thermal Energy Generation CDM Project	AMS-III.E. ver. 16, AMS-I.C. ver. 20
10077	Reducing Gas Leakages within the Titas Gas Distribution Network in Bangladesh	AM0023 ver. 4

As per the table above, no former project in Bangladesh shares the same technology/measure as that involved in the proposed CPA.

The assessment of former PoAs in the proposed CPA boundary is as follows:

CDM PoA Reference	PoA Title	Methodology Applied
10355	National Programme for Energy Efficiency Improvement in the Brick Manufacturing Sector in Bangladesh	AMS-III.Z. ver. 6

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9940	Energy and Water Saving Promotion Programme for Textile Dyeing Process of Bangladesh Textile and Garment Industries	AMS-II.D. ver. 12
9276	Energy Efficiency Program in Rural Bangladesh	AMS-III.AV. ver. 3
2765	Installation of Solar Home Systems in Bangladesh	AMS-I.A. ver. 14
4791	Improved Cooking Stoves in Bangladesh	AMS-II.G. ver. 3
4793	Efficient Lighting Initiative of Bangladesh (ELIB)	AMS-II.J. ver. 4
9992	Programme for Promotion of Access to Domestic Biogas in Rural Bangladesh	AMS-I.E. ver. 5
10096	Programmatic CDM project using Municipal Organic Waste of 64 Districts of Bangladesh	AMS-III.F. ver. 11
10512	IDCOL Improved Cook Stove Program	AMS-II.G. ver. 10.0

As per aforesaid, the proposed CPA is in the same region as that of 2 former PoA sharing similar technology / measure (i.e. improved Cookstoves) as follows:

CDM PoA Reference	Title	Methodology
4791	Improved Cooking Stoves in Bangladesh	AMS-II.G. ver. 3
10512	IDCOL Improved Cook Stove Program	AMS-II.G. ver. 10.0

It is hereby declared that the proposed CPA will not lead to the discontinuation or modification of the former projects and does not decrease the GHG emission reductions or net anthropogenic GHG removals by the former PoA, and that the proposed CPA complies with the following conditions:

Requirement	Justification
a) It utilizes both a different measure and a different technology from those of the former project	The ICS units under the proposed CPA are unique to this PoA and are not included in any of the former project listed above.
b) It does not share or utilize any of the assets of the former project;	The ICS units under the proposed CPA are uniquely identifiable by a serial number and is uniquely assigned to the proposed CPA. The proposed CPA does not utilize any assets of former project.
c) It utilizes a different resource type compared to the former project.	The ICS units under the proposed CPA are uniquely identifiable by a serial number and is uniquely assigned to the proposed CPA. The proposed CPA does not utilize same resource as any former project.

A.8. Debundling

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Not applicable, refer section F.

SECTION B. Application of methodologies and standardized baselines**B.1. Reference to methodologies and standardized baselines**

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AMS II.G. "Energy efficiency measures in thermal applications of non-renewable biomass" (Version 08.0)

<https://cdm.unfccc.int/UserManagement/FileStorage/S05JFDNZBV9YMCQT2UE6XWO174PL3A>

Tool 30: Calculation of the fraction of non-renewable biomass (Version 01.0)

<https://cdm.unfccc.int/methodologies/PAMethodologies/tools/am-tool-30-v1.pdf>

Standard: Sampling and surveys for CDM project activities and programmes of activities, version 7.0

https://cdm.unfccc.int/filestorage/e/x/t/extfile-20170509173059588-Methodology_standard05_EB94a02-ver07.0-4may17-.pdf/Methodology_standard05_EB94a02%28ver07.0%2C%204may17%29?t=aEx8cTZjemN1fDAhP0FGv_X1SA_avo9zPRDQ

Standard: Sampling and surveys for CDM project activities and programmes of activities, version 7.0

https://cdm.unfccc.int/filestorage/e/x/t/extfile-20170509173059588-Methodology_standard05_EB94a02-ver07.0-4may17-.pdf/Methodology_standard05_EB94a02%28ver07.0%2C%204may17%29?t=aEx8cTZjemN1fDAhP0FGv_X1SA_avo9zPRDQ

B.2. Project boundary, sources and greenhouse gases (GHGs)

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Source		GHG	Included?	Justification/Explanation
Baseline	Combustion of non-renewable biomass for cooking in baseline devices	CO ₂	Yes	Major emission source
		CH ₄	No	Minor emission source, excluded as conservative measure
		N ₂ O	No	Minor emission source, excluded as conservative measure
Project activity	Combustion of non-renewable biomass for cooking in project devices	CO ₂	Yes	Major emission source
		CH ₄	No	Minor emission source, excluded as conservative measure
		N ₂ O	No	Minor emission source, excluded as conservative measure

B.3. Establishment and description of baseline scenario

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Biomass serves for 90% of Bangladeshi households' energy needs with fuelwood being used in around 84% households for cooking purposes (section 1.5, page 8, Country Action Plan for Clean Cookstoves). Also, more than 90% households still use traditional stoves for cooking⁶.

The current cooking practice in Bangladesh is the use of "three-stone" cooking stove, popularly known as traditional stoves. 98–99% of Bangladesh rural population burns biomass fuels by using traditional cookstoves for cooking and heating. Households generally construct traditional cookstoves themselves with locally available materials and use biomass fuels⁷.

As per World Bank Report, ~95 percent of Bangladeshi households collect or purchase biomass energy to cook all or part of their meals, mainly using fixed clay stoves. The inherent inefficiency of such stoves, combined with the high moisture content of biomass cooking fuels, results in incomplete combustion, producing IAP⁸. Thus, biomass combustion with traditional cookstoves causes substantial environmental and health harm.

⁶ Country Action Plan for Clean Cookstoves, November 2013, Power Division, Ministry of Power, Government of the People's Republic of Bangladesh, page 39

⁷ Peer review paper published in PNAS, July 3, 2012, vol. 109, no. 27, 10815–10820, "Low demand for nontraditional cookstove technologies" by Mobarak et al

⁸ Special Report - Restoring Balance: Bangladesh's Rural Energy Realities, Executive Summary, page xx

B.4. Estimation of emission reductions**B.4.1. Explanation of methodological choices**

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$B_{y,savings,i,j}$ shall be determined using option 3 (equation 6 in particular) as per para 20 of the methodology.

The loss in efficiency of the project device type i shall be determined based on para 25(c) or 25(d) of the methodology to be specified in the specific case CPA

$B_{y,savings,i,j}$ shall be multiplied by a net to gross adjustment factor of 0.95 to account for leakages, thereby eliminating the need for ex-post surveys to determine leakages.

B.4.2. Data and parameters fixed ex ante

Data/Parameter	$B_{old,p}$
Data unit	tonnes/person/year
Description	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
Source of data	AMS II.G. version 8.0
Value(s) applied	0.50
Choice of data or Measurement methods and procedures	Default value specified by the methodology.
Purpose of data	To calculate baseline emission (For parameter $B_{old,HH}$)
Additional comment	The value may be updated during the crediting period with applicable value from approved standardized baseline. Assessments, information and results established in initial CPAs may be used in subsequent CPAs in lieu of conducting fresh assessments at each CPA level in absence of new data.

Data/Parameter	$N_{p,HH}$
Data unit	Number
Description	Average number of persons served per household prior to the project implementation
Source of data	The Bangladesh Multiple Indicator Cluster Survey (MICS) 2019 ⁹
Value(s) applied	4.3
Choice of data or Measurement methods and procedures	Published information / literature defining the average household size in the project region
Purpose of data	To calculate baseline emission (For parameter $B_{old,HH}$)
Additional comment	The MICS carried out in 2019 by Bangladesh Bureau of Statistics (BBS) in collaboration with UNICEF Bangladesh, as part of the Global MICS Programme is the most recent publicly available national report giving household size in Bangladesh

⁹https://mics-surveys-prod.s3.amazonaws.com/MICS6/South%20Asia/Bangladesh/2019/Survey%20findings/Bangladesh-MICS-2019-SFR_English.pdf

Data/Parameter	f_{NRBy}
Data unit	Fraction
Description	Fraction of woody biomass saved by the project activity during year y that can be established as non-renewable biomass
Source of data	10431-P1-0001-CP1 registered CPA-DD, section B.4.2, page 8
Value(s) applied	0.843
Choice of data or Measurement methods and procedures	Calculated as per Tool: Calculation of the fraction of non-renewable biomass, EB 97, Annex 9, in accordance with para 27 – 30 of AMS II.G. version 08.0
Purpose of data	To calculate baseline emission
Additional comment	As per registered PoA-DD, assessments, information and results established in initial CPA may be used in subsequent CPAs in lieu of conducting fresh assessments at each CPA level in absence of new data.

Data/Parameter	$B_{old,HH}$
Data unit	tonnes/household/year
Description	Annual quantity of woody biomass that would have been used in the household in the absence of the project activity to generate useful thermal energy equivalent to that provided by the project devices
Source of data	Calculated or determined using ex-ante baseline surveys/ published information / literature
Value(s) applied	2.15
Choice of data or Measurement methods and procedures	Calculated as $B_{old,p} * N_{p,HH}$
Purpose of data	To calculate baseline emission (For parameter $B_{old,i,j}$)
Additional comment	Assessments, information and results established in initial CPA may be used in subsequent CPAs in lieu of conducting fresh assessments at each CPA level in absence of new data. Further as CPA IMPLEMENTER plans distribution of only one ICS unit per household, $B_{old,HH} = B_{old,i,j}$ During the stove installation, the presence of existing project ICS, if any, shall be monitored and in case an existing project ICS is found installed in the same household, the subsequent (second) ICS will not be included in the ER calculations. Alternatively, the presence of multiple project ICS in a household may be determined ex-post during surveys and the total ICS population shall be discounted by the fraction of sampled household found using more than one project ICS.

Data/Parameter	$EF_{project_fossilfuel}$
Data unit	tCO ₂ e/TJ
Description	Emission factor for the fossil fuels projected to be used for substitution of non-renewable woody biomass by similar consumers
Source of data	AMS-II.G. ver 08.0 equation (2), page 5
Value(s) applied	81.6
Choice of data or Measurement methods and procedures	Default value specified by the methodology AMS.II-G ver 08.0, equation (2) on page 5 https://cdm.unfccc.int/methodologies/DB/DP2BYDIV6RTMZPEZ2EDLYGLJDPSSU3
Purpose of data	To calculate baseline emission
Additional comment	The parameter value is fixed ex ante at PoA level

Data/Parameter	LAF_y
Data unit	Fraction
Description	Leakage adjustment factor
Source of data	AMS II.G. version 08.0 Para 42 (c)
Value(s) applied	0.95
Choice of data or Measurement methods and procedures	As per the methodology AMS II.G ver 08.0, Gross adjustment factor of 0.95 to account for leakages, in which case surveys are not required
Purpose of data	Leakage calculation
Additional comment	The parameter value is fixed at PoA level

SC_{old} and $HC_{i,j}$ are not applicable in light of methodological choices made under the CPA.

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The following parameters are part of section 6.1 “parameters to be monitored” as per AMS II.G. version 08.0. However, these have been fixed ex-ante at the generic CPA 1 level as the Generic CPA 1 aims at distribution of wood-fuel ICS replacing traditional wood-fuel stoves in the baseline.

Data/Parameter	$NCV_{biomass}$
Data unit	TJ/tonne
Description	Net calorific value of the non-renewable woody biomass, briquettes or charcoal used in project devices.
Source of data	AMS-II.G. ver 08 - Pg 17, data/parameter table 12
Value(s) applied	0.015
Choice of data or Measurement methods and procedures	IPCC default for wood fuel, 0.015 TJ/tonne, based on the gross weight of the wood that is ‘air-dried’ may be used if fuel used in project device is also woody biomass.
Purpose of data	To calculate baseline emission
Additional comment	Fixed at ante for all CPAs following generic CPA 1

Data/Parameter	$\eta_{old,i,j}$			
Data unit	Fraction			
Description	Efficiency of pre - project device, which is a three-stone fire using fuelwood (not charcoal), or a conventional device with no improved combustion air supply or flue gas ventilation			
Source of data	PoA 10431 registered PoA-DD, section I.6.2, page 16			
Value(s) applied	0.11			
Choice of data or Measurement methods and procedures	Default value suggested in AMS.II-G ver 08.0 for a three-stone fire using fuelwood (not charcoal), or a conventional device with no improved combustion air supply or flue gas ventilation = 0.10			
	Default value suggested in AMS.II-G ver 08.0 for other types of devices = 0.20			
	Population using Three Stone Fire / conventional stoves	90%	fraction (%)	Country Action plan for clean cookstoves, Nov 2013
	Population using other baseline Cookstoves	10%	fraction (%)	Calculated (100% - 90%)
	Efficiency of Three Stone Fire Stove / conventional stoves	10%	fraction (%)	AMS II.G. default value
	Efficiency of other baseline Cookstoves	20%	fraction (%)	AMS II.G. default value
	Weighted average baseline stove efficiency	11.00%	fraction (%)	Calculated
Purpose of data	To calculate baseline emission			
Additional comment	Fixed ex-ante for all CPAs following generic CPA 1			

B.4.3. Ex ante calculation of emission reductions

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As per applicable meth, AMS-II.G. version 08.0; formula to calculate emission reductions (ERs)¹⁰ is:

$$ER_y = \sum_i \sum_j ER_{y,i,j} - LE_y \quad (1)$$

¹⁰ The methodology directly gives formulae for emission reductions without giving separate algorithms for baseline, project and leakage emissions. Hence $ER_y = BE_y$ and $PE_y = LE_y = 0$. The purpose of data in parameter tables is therefore mentioned as ‘to calculate baseline emissions’

Where

i	= Indices for the situation where more than one type of project device is introduced to replace the pre-project devices ¹¹
j	= Indices for the situation where there is more than one batch of project device
ER_y	= Emission reductions during year y in t CO ₂ e
$ER_{y,i,j}$	= Emission reductions by project device of type i and batch j during year y in t CO ₂ e
LE_y	= Leakage emissions in the year y

Where

$$ER_{y,i,j} = B_{y,savings,i,j} \times N_{y,i,j} \times \mu_y \times f_{NRB,y} \times NCV_{biomass} \times EF_{projected_fossil\ fuel} \quad (2)$$

Where

$B_{y,savings,i,j}$	= Quantity of woody biomass that is saved in tonnes per cook stove device of type i and batch j during year y
$f_{NRB,y}$	= Fraction of woody biomass that can be established as non-renewable biomass using survey methods or government data or default country specific fraction of non-renewable woody biomass (f_{NRB}) values available on the CDM website
$NCV_{biomass}$	= Net calorific value of the non-renewable woody biomass that is substituted (IPCC default for wood fuel, 0.015 TJ/tonne, based on the gross weight of the wood that is 'air-dried')
$EF_{projected_fossilfuel}$	= Emission factor for the fossil fuels projected to be used for substitution of non-renewable woody biomass by similar consumers. Use a value of 81.6 t CO ₂ /TJ
$N_{y,i,j}$	= Number of project devices of type i and batch j operating during year y
μ_y	= Adjustment to account for any continued use of pre-project devices during the year y when applying equations 6 (fraction).

$$B_{y,savings,i,j} = B_{old,i,j} \times \left(1 - \frac{\eta_{old,i,j}}{\eta_{new,i,j}} \right) \quad (6)$$

Where

$B_{old,i,j}$	= Annual quantity of woody biomass that would have been used in the absence of the project activity to generate useful thermal energy equivalent to that provided by the project device type i and batch j
$\eta_{new,i,j}$	= Efficiency of the device of each type i and batch j implemented as part of the project activity.
$\eta_{old,i,j}$	= Efficiency of pre - project device, which is a three-stone fire using firewood (not charcoal), or a conventional device with no improved combustion air supply or flue gas ventilation, that is without a grate or a chimney;

$$B_{old,i,j} = B_{old,HH} = B_{old,p} \times N_{p,HH} \quad (10)$$

¹¹ For example, in some instances, full replacement of the pre-project device would require the implementation of more than one project device (e.g. one stove suitable for cooking and the other stove suitable for cooking/boiling water)

Where

$B_{old,HH}$ = 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 devices¹²

$B_{old,p}$ = 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

$N_{p,HH}$ = Average number of persons served per household prior to the project implementation

For One Unit of Project Stove:

$B_{old,l,j}$		$B_{old,p}$		$N_{p,HH}$		LAF
Tonnes/HH/year		tonnes/person/year		person/HH		fraction
2.04	=	0.50	*	4.30	*	0.95

$B_{y,savings,l,j}$		$B_{old,l,j}$		$(1 - \eta_{old,l,j} / \eta_{new,l,j})$
Tonnes/year		Tonnes/year		--
1.38	=	2.04	*	$(1 - 0.11/0.34)$

ER_y		$B_{y,savings}$		$N_{y,i,j}$		μ_y		$f_{NRB,y}$		$NCV_{biomass}$		$EF_{projected_fossil\ fuel}$		$Stove_{year}$
tCO ₂ e/year		Tonnes/year		number		fraction		--		TJ/Tonne		tCO ₂ e/TJ		--
1.43	=	1.38	*	1	*	1	*	0.84	*	0.015	*	81.60	*	1

Year	Sales	Expiries	Net Number of stoves	Projected operational stove years	Emission Reductions (tCO ₂)
Year 1	1,000,000	0	1,000,000	1	1,425,673
Year 2	1,000,000	0	2,000,000	1	2,851,346
Year 3	0	0	2,000,000	1	2,851,346
Year 4	0	0	2,000,000	1	2,851,346
Year 5	0	0	2,000,000	1	2,851,346
Year 6	0	0	2,000,000	1	2,851,346
Year 7	0	0	2,000,000	1	2,851,346
Year 8	1,000,000	-1,000,000	2,000,000	1	2,851,346
Year 9	1,000,000	-1,000,000	2,000,000	1	2,851,346
Year 10	0	0	2,000,000	1	2,851,346
Total	4,000,000	-2,000,000	-	-	27,087,790

¹² $B_{old,i,j} = B_{old,HH}$ has been considered as the CPA envisages distributing only one project ICS per household. The presence of existing project devices, if any, shall be monitored ex-post and subsequent project ICS in the same household will not be included in the CPA.

The expiries are envisaged after end of expected operational lifetime of ICS (7 years) and maybe replaced by new stoves (as demonstrated above). Otherwise, if expired devices are not replaced, emission reductions will be claimed only till the operational life span of the project devices.

B.4.4. Summary of ex ante estimates of emission reductions

Year	Baseline emissions (t CO₂e)	Project emissions (t CO₂e)	Leakage (t CO₂e)	Emission reductions (t CO₂e)
Year 1	1,425,673	0	0	1,425,673
Year 2	2,851,346	0	0	2,851,346
Year 3	2,851,346	0	0	2,851,346
Year 4	2,851,346	0	0	2,851,346
Year 5	2,851,346	0	0	2,851,346
Year 6	2,851,346	0	0	2,851,346
Year 7	2,851,346	0	0	2,851,346
Year 8	2,851,346	0	0	2,851,346
Year 9	2,851,346	0	0	2,851,346
Year 10	2,851,346	0	0	2,851,346
Total	27,087,790	0	0	27,087,790
Total number of crediting years	10			
Annual average over the crediting period	2,708,779	0	0	2,708,779

B.5. Monitoring plan**B.5.1. Data and parameters to be monitored**

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	Sales database and monitoring survey
Value(s) applied	2,000,000
Measurement methods and procedures	CPA Implementer shall maintain the database of all stoves installed. The number of operating stoves for each device i and batch j shall be determined on a sampling basis. The results from monitoring were used to calculate $N_{y,i,j}$ as follows $N_{y,i,j} = (n_{i,j,operational} / n_{i,j,total}) * N_{y,i,j,installed}$ Where: N = number of stoves n = number of samples
Monitoring frequency	At least once every two years (biennial)
QA/QC procedures	A 95 /10 confidence / margin of error shall be achieved for the sampling parameter irrespective of annual / biennial monitoring frequency as per para 22 of Standard: Sampling and surveys for CDM project activities and programmes of activities, Version 07.0 In the case the desired precision is not met, lower bound values shall be used against repeating the survey to determine the operational fraction of stoves
Purpose of data	To calculate baseline emissions
Additional comment	All data sources will be archived for two years During the stove installation, the presence of existing project ICS, if any, shall be monitored and in case an existing project ICS is found installed in the same household, the subsequent (second) ICS will not be included in the ER calculations. Alternatively, the presence of multiple project ICS in a household may be determined ex-post during surveys and the total ICS population shall be discounted by the fraction of sampled household found using more than one project ICS.

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	Monitoring survey report
Value(s) applied	1
Measurement methods and procedures	Option 2 has been selected to determine μ_y. The sampled households will be checked for presence of baseline stove and if it was being used along with project stove for cooking. For samples where baseline stove was found not being used, $\mu_y = 1.0$ For samples where the baseline stove is found to be in use, μ_y shall be determined as: ratio of frequency of usage (i.e. number of meals cooked on ICS Vs Total number of meals cooked on ICS and baseline stove) For example, during the survey if was found that total average use of project ICS is 3 times per day and that of baseline stove is 5 times per week, $\mu_y = 3*7 / (3*7 + 5)$. If no information is available on relative usage levels of baseline stove and ICS a default adjustment fraction of 50:50 shall be applied to those samples.
Monitoring frequency	At least once every two years (biennial)
QA/QC procedures	A 95 /10 confidence / margin of error shall be achieved for the sampling parameter irrespective of annual / biennial monitoring frequency as per para 22 of Standard: Sampling and surveys for CDM project activities and programmes of activities, Version 07.0 In the case the desired precision is not met, lower bound values shall be used against repeating the survey to determine the operational fraction of stoves
Purpose of data	To calculate baseline emissions
Additional comment	All data sources will be archived for two years

Data/Parameter	$\eta_{new,i,j}$
Data unit	Fraction
Description	Efficiency of the project device of each type i and batch j
Source of data	Certificate issued by national standards body or an equivalent thereof
Value(s) applied	0.34
Measurement methods and procedures	Efficiency certified by a national standards body or an appropriate certifying agent recognized by that body
Monitoring frequency	Recorded at the time of commissioning/distribution
QA/QC procedures	Manufacturer's thermal energy efficiency specification or certification must be based on WBT protocol
Purpose of data	To calculate baseline emissions
Additional comment	For subsequent monitoring periods to calculate efficiency loss, CPAs can use any one of the following options given in para 25 of AMS II.G. version-08 (c) Determine the rate of efficiency drop for a representative sample of the first batch of project device i in year y and assume that same rate of loss in efficiency applies to all other batches. In other words, it may be assumed that the degradation of efficiency measured in a representative sample of the first batch of project devices i apply to all subsequent batches. The efficiency of the project devices in the first batch has to be monitored annually through representative samples and this rate of loss in efficiency may be applied correspondingly to all batches (d) Determine the loss in efficiency annually from a representative sample of each batch and use the actual loss rate that is measured

Data/Parameter	Date of commissioning of project device i
Data unit	Date
Description	Actual Date of commissioning of project device
Source of data	Sales database
Value(s) applied	Refer the sales database
Measurement methods and procedures	Each sale will be recorded in sales database along with the name of recipient, contact details, location of household (village, district etc). The date of installation is deemed as date of commissioning of the ICS.
Monitoring frequency	Recorded at the time of installation of project devices
QA/QC procedures	NA
Purpose of data	To calculate baseline emissions
Additional comment	Record will be archived for 2 years

B.5.2. Sampling plan

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Sampling Plan across CPAs within the PoA

Representative sampling will be undertaken as part of a cross-CPA Sampling Plan in line with the requirements of the methodology applied and the Standard: Sampling and surveys for CDM project activities and programmes of activities, version 7.0

Sample sizes will be sufficient to ensure that the precision of the sample means/proportions are in accordance with the methodological / standard requirements. In cases where survey results indicate that desired precision is not achieved, the lower bound value of corresponding confidence interval of the parameter value may be used as an alternative to repeating the survey. Alternatively, the survey may be expanded to reach the required confidence/precision.

The sampling methodology will be in accordance with the representative sampling methods provided by the methodology AMS–II.G. and other CDM sampling guidelines and standards as indicated along this section, with the applicable methodology having precedence. The Standard (paragraph 22) mandates application of 95/10 confidence/precision for CPAs solely composed of micro-scale CDM units hence the same shall be applied as a conservative measure despite the methodology taking precedence.

Sampling Methodology

Sampling Objective – The sampling objective for each parameter is to determine, via sampling survey / test, a statistically significant parameter value for the emission reduction calculations. These parameters are as listed I.7.1 above.

Field Measurement Objective and data to be collected – As listed in Section I.7.1.

Target population and sampling frame – The target population is the total population served under the PoA, and the sampling frame consists of aggregated data of end-users of the ICS as recorded in the CPA Databases. The sampling frame will be kept for 2 years following the crediting period or the last issuance of the CERs of the project activity.

Sample method – Sampling will be conducted using stratified random sampling techniques over the sampling frame, and detailed calculations are provided below as per CDM guidelines “Sampling and surveys for CDM project activities and programmes of activities” the ICS in the sampling frame shall be stratified by ICS model type i (one pot or two pot) and batch j (year of installation).

Stratified Random Sampling will be used to select samples from the Project Database for monitoring parameters. Optionally, other sampling approaches may be used in accordance with Standard “Sampling and surveys for CDM project activities and programmes of activities” and Guideline for Sampling and Surveys for CDM Project Activities and Programme of Activities, when sampling techniques or statistical analysis necessitates it.

The sample size shall be determined using the following formula:

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

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)

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

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

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

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

Where,

g_i = weight of strata i in the population

p_i = expected proportion of strata i in the population

k = total number of strata in the population

For Mean based parameters ($\eta_{y,i,j}$)

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

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

SD_i = expected standard deviation of strata i in the population

m_i = expected mean of strata i in the population

To ensure a random stratified sample selection, random number generators shall be applied. Each ICS in the target population is uniquely identifiable by its Serial ID number. Each ICS can thus be allocated a Sample Selection Number in each monitoring period, starting at 1 and increasing up to the total number of ICS in the Database for that pre-defined stratified sampling frame. Applying the random number generators, the ICS can then be randomly chosen from the defined population up to the required sample size as calculated by the CME.

During sampling, there may be non-response from the target population. Over-sampling may be used to avoid non-response; however, sampling may be cease once required confidence/precision is met.

In the case of parameters monitored for the first time the expected variation for that measure in the sample may be based on results from similar studies, pilot studies, or from the project planner's own knowledge / experience of the data (as per para 12 of Standard)

B.5.3. Other elements of monitoring plan

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The CPA will have a specific CPA Database where information on ICS installed under the CPA will be recorded. An individual sales record will be collected from each stove user at the point of sale/installation. The CPA Implementer makes every effort to retrieve this information (paper form or

electronically (eg. SMS)) but cannot guarantee the collection of information for each ICS due to challenges such as high rates of illiteracy and logistical challenges. ICS with end-user details recorded will serve as the sampling frame for monitored parameters.

To reduce monitoring efforts, a single sample set is drawn based on which various parameters shall be monitored. The CPA Implementer will determine the number of samples to be monitored for each of the parameters separately. The CPA Implementer may decide to stop monitoring of a parameter during the campaign once the required precision for this parameter is achieved. The monitoring team may continue to monitor appliances in the sample with respect to the remaining parameter(s) until again the required precision for these parameters is achieved. The design of the survey questionnaire will ensure that the questions are non-intrusive and easy to understand for both the interviewee and interviewer.

Also, for determining thermal efficiency, the CPA Implementer may select sub-sample within the common survey sample (as per stratification requirements) in line with para 41 of the methodology.

Training will ensure that all monitoring staff has the appropriate skills and experience to administer relevant surveys / tests and quality checks will ensure the integrity of information flow to the CME. The CME shall review the efficacy of information gathering techniques and information flow and assess enumerator and partner feedback to make improvements as deemed necessary.

Third parties hired by the CPA Implementer, if any, to carry out sampling should have requisite skills and appropriate experience with data entry and data management. The CPA Implementer will ensure that contractors are adequately trained for the tasks they are contracted for (eg. carrying out of WBTs). Training will also be provided on how to deal with non-responses, refusals and other problems should these occur.

SECTION C. Start date, crediting period type and duration

C.1. Start date of CPA

>>

The CPA hasn't started yet. It is expected to start on 15/03/2020

C.2. Expected operational lifetime of CPA

>>

10 years

C.3. Crediting period of CPA

C.3.1. Type of crediting period

>>

10-year fixed.

C.3.2. Start date of crediting period

>>

15/03/2020 or date of inclusion of CPA in the registered PoA, whichever is later.

C.3.3. Duration of crediting period

>>

10y-0m

SECTION D. Environmental impacts

D.1. Analysis of environmental impacts

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not applicable, this is done at PoA level

D.2. Environmental impact assessment

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not applicable, this is done at PoA level

SECTION E. Local stakeholder consultation**E.1. Modalities for local stakeholder consultation**

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not applicable, this is done at PoA level

E.2. Summary of comments received

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not applicable, this is done at PoA level

E.3. Consideration of comments received

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not applicable, this is done at PoA level

SECTION F. Eligibility for inclusion

No.	Eligibility criterion - Category	Eligibility criterion - Required condition	Supporting evidence for inclusion	Description of this CPA in relation to the criterion and supporting evidence
1	Geographic Boundary	The ICS under the CPA must operate within the geographical boundary of the PoA i.e. Republic of Bangladesh	Sales database listing the country of installation of PoA ICS	All ICS under the CPA shall be installed within Bangladesh.
2	Double Counting	Carbon emission reductions claimed by the CPA should be unique and not counted more than once	Each ICS shall be assigned a unique serial number which shall be displayed at the beneficiary location to identify each stove uniquely.	Each ICS has a provision of unique serial number which avoids double counting
3	Exclusiveness of CPA	The CPA shall not be previously: 1. Registered as a CDM project activity 2. Included as a CPA in any other registered PoA, or deregistered as a CPA of a PoA	Confirmation by CME	Confirmed by CME

No.	Eligibility criterion - Category	Eligibility criterion - Required condition	Supporting evidence for inclusion	Description of this CPA in relation to the criterion and supporting evidence
4	Specifications of Technology/Measure	Type - The program will promote dissemination of wood-fuel ICS in Bangladesh. Capacity - The rated annual thermal energy savings of ICS included under the CPAs shall not be more than 1.8GWh_{th}. Key Design Features – - The stoves shall have a fuel grate and/or a chimney - The stove shall be fixed or portable type. - The rated efficiency of technologies included under the program will be at least 20 per cent..	Technical details of the ICS (including thermal efficiency) will be provided in the specific CPA. As specific CPA may have progressive sales and new models may be introduced during the course of the CPA, this may be checked at the time of subsequent verification wrt to new models / incremental installations.	The technical details of the two stove models demonstrate compliance with the requirement.
5	Start Date	Date on which first ICS was installed under the CPA. The start date of any proposed CDM CPA will be on or after the start date of the proposed CDM PoA	End user agreement / voucher / installation report etc for the first ICS in the CPA.	15/02/2018 is the start date of PoA (webhosting of PoA DD on UNFCCC website for validation). The CPA hasn't started yet. It is expected to start on 15/03/2020
6	Applicability of the methodologies	CPA must follow AMS.II-G ver 08.0. The applicability of methodology at CPA level has already been demonstrated in section I.2 above. Technology related requirements have been specified in criteria #3 above.	CPA-DDs applying AMS II.G. Version 8.0	The CPA follows version 8.0 of AMS II.G. as mentioned in section B.1

No.	Eligibility criterion - Category	Eligibility criterion - Required condition	Supporting evidence for inclusion	Description of this CPA in relation to the criterion and supporting evidence
7	Additionality	1. ICS shall be installed at households or SMEs The rated annual thermal energy savings of ICS included under the CPAs shall not be more than 1.8GWh_{th}	1. ICS shall be installed at households or SMEs substantiated via sales database. 2. The CPA-DD shall include a demonstration of ICS meeting the 1.8GWh_{th} annual energy savings based on design specifications of stoves. As specific CPA may have progressive sales and new models may be introduced during the course of the CPA, this may be checked at the time of subsequent verification wrt to new models.	Refer ER calculator for the same. 1 unit of ICS saves 0.0058 GWh _{th} annually.
8	LSC and EIA	The local stakeholder consultation is conducted at the PoA level (Section F of the PoA-DD). An environmental impact analysis is not required (section E of the PoA-DD)	--	Not applicable
9	Public Funding	Affirmation that funding from Annex I Parties, if any, does not result in a diversion of official development assistance	Please refer Annex [XX]. Declaration from CME and CPA that no funds for official development assistance will be used for program implementation	Confirmation submitted by CME
10	Target Group and Distribution Mechanism	Target Group: Households / SMEs Distribution Mechanism: Via local partners	Sales database listing the installation of PoA ICS	Refer sales database
11	Sampling	CPAs under the program will adhere to all requirements as mentioned in <i>Standard: Sampling and surveys for CDM project activities and programme of activities</i>	CPAs will follow monitoring plan described in CPA-DD section I.7.2	Refer section B.5.2 above

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No.	Eligibility criterion - Category	Eligibility criterion - Required condition	Supporting evidence for inclusion	Description of this CPA in relation to the criterion and supporting evidence
12	SSC Threshold	Not applicable as per section 1.2 above	--	Not applicable
13	Debundling Check	Not applicable as per section 1.2 above	--	Not applicable

Appendix 1. Contact information of CPA implementers

Organization name	Bangladesh Bondhu Foundation
Country	Republic of Bangladesh
Address	House # 3/2 (1st Floor), Block # B, Lalmatia, Dhaka - 1207
Telephone	0088-02-9127487
Fax	0088-02-8154229
E-mail	khaleq.zaman@bondhufoundation.org
Website	
Contact person	Md. Khalequzzaman

Appendix 2. Affirmation regarding public funding

No public funding is involved in the CPA

Appendix 3. Further background information on ex ante calculation of emission reductions

Not Applicable

Appendix 4. Further background information on monitoring plan

Not Applicable

Appendix 5. Summary report of comments received from local stakeholders

Not Applicable

Appendix 6. Summary of post-registration changes

Not Applicable

Appendix 7. Person/entity responsible for completing the CDM-CPA-DD-FORM (additional)

Organization name	Climate-Secure Services
Address	65, Pragati Apartments, Club Road, Paschim Vihar, West Delhi, Delhi – 110063
Country	India
Telephone	+91 11 2521 3080
E-mail	info@climate-secure.com
Website	www.climate-secure.com
Contact person	Rohit Lohia

Document information

<i>Version</i>	<i>Date</i>	<i>Description</i>
09.0	31 May 2019	Revision to: • Ensure consistency with version 02.0 of the “CDM project standard for programmes of activities” (CDM-EB93-A07-STAN); • Make editorial improvements.
08.1	20 October 2017	Editorial revision to remove appendix “Applicability of methodologies and standardized baselines” from the main part of the form which had been mistakenly kept in the previous version.
08.0	28 June 2017	Revision to: • Remove appendix “Applicability of methodologies and standardized baselines” as the appendix is not relevant at the CPA level; • Make editorial improvement.
07.0	7 June 2017	Revision to: • Improve consistency with the “CDM project standard for programmes of activities” and with the PDD and PoA-DD forms; • Make editorial improvement.
06.0	24 May 2017	Revision to: • Ensure consistency with the “Standard: CDM project standard for programme of activities” (CDM-EB93-A07-STAN) (version 01.0); • Incorporate the “Component project activity design document form for small-scale component project activities” (CDM-SSC-CPA-DD-FORM); • Make editorial improvement.
05.0	15 April 2016	Revision to ensure consistency with the “Standard: Applicability of sectoral scopes” (CDM-EB88-A04-STAN) (version 01.0).
04.0	9 March 2015	Revision to: • Include provisions related to statement on erroneous inclusion of a CPA; • Include provisions related to delayed submission of a monitoring plan; • Provisions related to local stakeholder consultation; • Provisions related to the Host Party; • Make editorial improvement.
03.0	25 June 2014	Revisions to: • Include the Attachment: Instructions for filling out the component project activity design document form for CDM component project activities (these instructions supersede the "Guidelines for completing the component project activity design document form" (Version 01.0)); • Include provisions related to standardized baselines; • Add contact information on a CPA implementer and/or responsible person/ entity for completing the CDM-CPA-DD-FORM in A.13. and Appendix 1; • Add general instructions on post-registration changes in paragraph 4 and 5 of general instructions and Appendix 6;

<i>Version</i>	<i>Date</i>	<i>Description</i>
		• Change the reference number from F-CDM-CPA-DD to CDM-CPA-DD-FORM; • Make editorial improvement.
02.0	13 March 2012	Revision required to ensure consistency with the "Guidelines for completing the component project activity design document form" (EB 66, Annex 16).
01.0	27 July 2007	EB 33, Annex 42 Initial adoption.
Decision Class: Regulatory Document Type: Form Business Function: Registration Keywords: component project activity, project design document		