

TEMPLATE

MONITORING REPORT

PUBLICATION DATE 14.10.2020

VERSION v. 1.1

RELATED SUPPORT - TEMPLATE GUIDE Monitoring Report v. 1.1

This document contains the following Sections.

Key Project Information

SECTION A. DESCRIPTION OF PROJECT

SECTION B. IMPLEMENTATION OF PROJECT

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Appendix 1 – Contact Details of entity completing the TEMPLATE- Monitoring Report

KEY PROJECT INFORMATION

Programme of Activity Information

GS ID of Programme	GS 11570
Title of Programme	Improved cookstove program in Bangladesh supported by the Republic of Korea
Version of POA-DD applicable to this monitoring report	6.0
Name and GS ID of fully Validated VPA/VPAs (i.e. non-compliance check)	GS 11571 Improved cookstove program in Bangladesh supported by the Republic of Korea – CPA 02 GS 11572 Improved cookstove program in Bangladesh supported by the Republic of Korea – CPA 03

Key Project Information

GS ID (s) of Project (s)	PoA ID: GS 11570 VPA ID: GS 11571, GS 11572										
Title of the project (s) covered by monitoring report	GS 11571 Improved cookstove program in Bangladesh supported by the Republic of Korea – CPA 02 GS 11572 Improved cookstove program in Bangladesh supported by the Republic of Korea – CPA 03										
Version number of the PDD/VPA-DD (s) applicable to this monitoring report	<table> <tr> <th>PoA DD ID</th><th>Version No:</th></tr> <tr> <td>GS 11570</td><td>6.0</td></tr> <tr> <th>VPA IDs</th><th>Version No</th></tr> <tr> <td>GS 11571</td><td>7.0</td></tr> <tr> <td>GS 11572</td><td>7.0</td></tr> </table>	PoA DD ID	Version No:	GS 11570	6.0	VPA IDs	Version No	GS 11571	7.0	GS 11572	7.0
PoA DD ID	Version No:										
GS 11570	6.0										
VPA IDs	Version No										
GS 11571	7.0										
GS 11572	7.0										
Version number of the monitoring report	5.0										
Completion date of the monitoring report	25/09/2023										
Date of project design certification	12/09/2023										
Date of Last Annual Report	Not Applicable, given the project has undergone GS4GG transition in the year 2022.										
Monitoring period number	1 st of the crediting period 1										
Duration of this monitoring period	01/01/2021-31/12/2022 (Both Days Inclusive) MS1 : 01/01/2021 to 31/12/2021 MS2 : 01/01/2022 to 31/12/2022										
Project Representative	Value Network Venture Advisory Services Pte. Ltd.										
Host Country	People's Republic of Bangladesh										
Activity Requirements applied.	☒ Community Services Activities ☐ Renewable Energy Activities ☐ Land Use and Forestry Activities/Risks & Capacities										

	☐ N/A
Methodology (ies) applied and version number	AMS II.G.: Small-scale methodology: Energy efficiency measures in thermal applications of non-renewable biomass, version 08.0
Product Requirements applied	☒ GHG Emissions Reduction & Sequestration ☐ Renewable Energy Label ☐ N/A

Table 1 - Sustainable Development Contributions Achieved

Sustainable Development Goals Targeted	SDG Impact	Amount Achieved			Units/ Products
13 Climate Action (mandatory)	GSDM-13.2.1				
13.2 Integrate climate change measures into national policies, strategies, and planning	Amount of GHG emissions avoided or sequestered.	VPA →	GS 11571	GS 11572	tCO ₂ e
		MS1	468,151	468,152	
		MS2	677,123	677,123	
1 No Poverty	GSDM 1.1.1				
1.1 By 2030, eradicate extreme poverty for all people everywhere, currently measured as people living on less than \$1.25 a day.	Average household savings i.e., decrease in expenditure on basic service such cooking, lighting, drinking.	VPA→	GS 11571 & GS 11572		Taka/Year
		MS1	4,674		
		MS2	5,147		
5 Gender Equality					
5.4 Recognize and value unpaid care and domestic work through the provision of public services, infrastructure and social protection policies and the promotion of shared responsibility within the household and the family as nationally appropriate.	GSDM 5.4.1 Average time saving associated with cooking time and/or fuel collection.	VPA→	GS 11571 & GS 11572		Hrs/HH/day
		MS1	2.24		
		MS2	2.34		

7 Affordable and Clean Energy	GSDM 7.1.1											
7.1 By 2030, ensure universal access to affordable, reliable and modern energy services	Number of beneficiaries: Households.	<table><tr><th>VPA→</th><th>GS 11571</th><th>GS 11572</th></tr><tr><td>MS1</td><td>499,804</td><td>499,804</td></tr><tr><td>MS2</td><td>499,804</td><td>499,804</td></tr></table>	VPA→	GS 11571	GS 11572	MS1	499,804	499,804	MS2	499,804	499,804	Number
VPA→	GS 11571	GS 11572										
MS1	499,804	499,804										
MS2	499,804	499,804										
7 Affordable and Clean Energy	GSDG 7.1.2											
7.1 By 2030, ensure universal access to affordable, reliable and modern energy services	Proportion of population with primary reliance on clean fuels and technology.	<table><tr><th>VPA→</th><th>GS 11571 & GS 11572</th></tr><tr><td>MS1</td><td>98.48</td></tr><tr><td>MS2</td><td>96.34</td></tr></table>	VPA→	GS 11571 & GS 11572	MS1	98.48	MS2	96.34	%			
VPA→	GS 11571 & GS 11572											
MS1	98.48											
MS2	96.34											
8 Decent Work and Economic Growth												
8.5 By 2030, achieve full and productive employment and decent work for all women and men, including for young people and persons with disabilities, and equal pay for work of equal value.	GSDM 8.5.1	All reported employees are permanent employees										
	Total number of jobs.	<table><tr><th>VPA→</th><th colspan="2">GS 11571 & GS 11572</th></tr><tr><td>MS1</td><td>1070 Male</td><td>380 Female</td></tr><tr><td>MS2</td><td>1150 Male</td><td>450 Female</td></tr></table>	VPA→	GS 11571 & GS 11572		MS1	1070 Male	380 Female	MS2	1150 Male	450 Female	Number
VPA→	GS 11571 & GS 11572											
MS1	1070 Male	380 Female										
MS2	1150 Male	450 Female										
15 Life on Land												
15.1 By 2020, ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wetlands, mountains and drylands, in line with obligations under international agreements	GSDM 15.1.1											
	Total non-renewable wood fuel saved	<table><tr><th>VPA→</th><th>GS 11571 & GS 11572</th></tr><tr><td>MS1</td><td>1.155</td></tr><tr><td>MS2</td><td>1.148</td></tr></table>	VPA→	GS 11571 & GS 11572	MS1	1.155	MS2	1.148	Tonnes of NRB / HH / year			
VPA→	GS 11571 & GS 11572											
MS1	1.155											
MS2	1.148											

Table 2 – Product Vintages

GS 11571		Amount Achieved
Start Dates	End Dates	VERs (tCO2e)
01/01/2021	31/12/2021	468,151

01/01/2022	31/12/2022	677,123
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GS 11572		Amount Achieved
Start Dates	End Dates	VERs (tCO ₂ e)
01/01/2021	31/12/2021	468,152
01/01/2022	31/12/2022	677,123

SECTION A. DESCRIPTION OF PROJECT

A.1. General description of project

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The PoA involves distribution of biomass based improved cookstoves (“ICS”) to households / SMEs in Bangladesh.

Biomass accounts for 90% of Bangladeshi households’ energy needs with fuelwood being used in around 84% of households for cooking purposes (section 1.5, page 8, Country Action Plan for Clean Cookstoves). Also, more than 90% of households still use traditional stoves for cooking¹.

The current cooking practice in Bangladesh is the use of a “three-stone” cooking stove, popularly known as a traditional stove. 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 fuels².

As per World Bank Report, ~95 percent of Bangladeshi households collect or purchase biomass 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 IAP³. Thus, biomass combustion with traditional cookstoves causes substantial environmental and health harm.

The PoA attempts to address the aforesaid issues, by effecting widespread adoption of ICS to households/SMEs across Bangladesh. 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

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

² Peer review paper published in PNAS, July 3, 2012, vol. 109, no. 27, 10815–10820, “Low demand for non-traditional cookstove technologies” by Mobarak et al

³ Special Report - Restoring Balance: Bangladesh’s Rural Energy Realities, Executive Summary, page xx

traditional stoves, ICS reduce the amount of non-renewable biomass fuel consumption for meeting similar thermal energy needs. A reduction in consumption of non-renewable biomass contributes towards reduction in GHG emissions into the atmosphere. Thus, ICS reduce GHG emissions through their improved thermal efficiency as compared to the traditional/ baseline stoves.

This PoA is managed by Value Network Venture Advisory services Pte. Ltd. as the Coordinating/Managing Entity (CME). Bangladesh Bondhu Foundation (BBF) is the VPA Implementers for the aforesaid PoA.

A.2. Location of project

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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 boundary of Bangladesh is depicted by the map given below⁴.



The VPAs are 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"E⁵.

A.3. Reference of applied methodology

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⁴ https://www.researchgate.net/figure/Political-Map-of-Bangladesh-Source_fig1_328717393

⁵ <https://latitudelongitude.org/bd/dhaka/>

AMS II.G. - Small-scale methodology: Energy efficiency measures in thermal applications of non-renewable biomass, version 08.0
<https://cdm.unfccc.int/UserManagement/FileStorage/S05JFDNZBV9YMCQT2UE6XWO174PL3A>

A.4. Crediting period of project

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GS Ref ID	Crediting Period Start Date	Length of Crediting Period
GS11571	15/03/2020	10 years (5-yr renewable cycle)
GS11572		

SECTION B. IMPLEMENTATION OF PROJECT

B.1. Description of implemented project

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(a) Purpose of the specific-case VPA(s) and the measures taken for GHG emission reductions or net GHG removals by sinks;

The purpose of the VPAs is 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. The higher thermal efficiency of these ICSs, results in reduction of non-renewable biomass consumption for meeting the similar thermal energy needs as that in the baseline. A reduction in consumption of non-renewable biomass contributes towards reduction in GHG emissions into the atmosphere. Thus, ICS reduce GHG emissions through their improved thermal efficiency as compared to traditional/ baseline stoves.

(b) Description of the technology employed and installed equipment and/or infrastructure, including information requested by the eligibility criteria;

The VPAs include dissemination of 1 Pot and 2 Pot (models), high efficiency wood-fuel ICS (Bondhu Chulha) for meeting the thermal energy needs of beneficiary households/SMEs. The Bondhu Chulhas replace traditional inefficient wood-fuel cookstoves/3-stone fires in the baseline.

All ICS installed under the VPA are constructed from brick and/or cement concrete and have as accessories - a chimney with a cap, and grate. ICSs are designed to increase heat transfer, while also matching traditional utensils and cooking habits of people in Bangladesh. The improvement in efficiency is achieved by properly adjusting the dimensions of the combustion chamber and ensuring effective air flow to aid complete combustion of biomass. In comparison to traditional stoves, the VPA ICS provide a fuel savings of around 50% to cook the same amount of food.

Description (Technical specification)	1 Pot Bondhu Chulha	2 Pot Bondhu Chulha
Portable / Fixed	Fixed	Fixed
Fuel grate present (Yes/no)	Yes	Yes
Chimney Present (Yes/no)	Yes	Yes
Fuel Type	Wood-fuel	Wood-fuel
Fabrication Material	Cement concrete	Cement concrete
Design Thermal Efficiency (Fraction)	0.3400	0.3462
Design Operational Lifetime	upto 7 years	upto 7 years

The following table provides a summary of the ICS installations in each VPA:

Year	Month	GS 11571	GS 11572	Grand Total
2020	Mar	500	500	1,000
	Jul	31,280	31,280	62,560
	Aug	17,263	17,264	34,527
	Sep	19,614	19,614	39,228
	Oct	21,079	21,080	42,159
	Nov	24,139	24,140	48,279
	Dec	28,769	28,769	57,538
	Sub-Total	1,42,644	1,42,647	2,85,291
2021	Jan	30,588	30,587	61,175
	Feb	33,016	33,015	66,031
	Mar	38,329	38,330	76,659
	Apr	33,807	33,808	67,615
	May	31,388	31,388	62,776
	Jun	33,641	33,639	67,280
	Jul	20,365	20,364	40,729
	Aug	31,693	31,693	63,386
	Sep	38,895	38,894	77,789
	Oct	41,572	41,573	83,145
	Nov	23,866	23,866	47,732
	Sub-Total	357,160	357,157	714,317
Grand Total		499,804	499,804	999,608

(c) Relevant dates for the specific-case VPA(s) (e.g. construction, commissioning, continued operation periods, etc.);

VPA	GS ID	Commissioning date of VPA	Monitoring period	
			MS1	MS2
VPA 01	GS 11571	15/03/2020	01/01/2021	01/01/2022
VPA 02	GS 11572	15/03/2020	31/12/2021	31/12/2022

(d) Total GHG emission reductions or net GHG removals by sinks achieved in this monitoring period for the specific-case VPA(s), including information on how double counting is avoided.

VPA	Emission Reductions tCO ₂ e		
	MS1	MS2	Total
GS 11571	468,151	677,123	1,145,274
GS 11572	468,152	677,123	1,145,275
Total	936,303	1,354,246	2,290,549

Avoidance of double counting:

For each Bondhu Chula installed, the end user signs an agreement (customer agreement) with the PO/PE transferring the ownership of credits to PO/PE. At the time of installation, each Bondhu Chula is assigned a unique serial number. The PO/PE's technician collects information about the user, serial number of stove and the installation date at the time of installation in the customer agreement form. The agreement is signed by the user and the PO/PE authorized representative. The PO/PE is under contractual obligation with BBF to manufacture the stove using standard grade material and standard design specifications provided by BBF. Also, the POs/PEs assign the ownership of credits to BBF through this contract. Further, all VPAs included in the monitoring report are implemented by the CME, thus ensuring that the PO/PEs are aware of and agree that the cook stoves are included in this PoA.

For all VPAs included in the Monitoring Report, the information collected by PO/PEs technicians is transferred to its BBF's Head office – where they are screened to eliminate any double counting of ICS and/or incomplete, invalid entries. The electronic files containing each installation record are duplicated by paper documents received from individual householders. BBF maintains a summary of all installations in an excel sheet with a clear demarcation of the VPA Boundaries. This PoA level database, containing stove and user record is maintained and updated regularly.

Lastly, the VPAs shall claim emission reductions of a given vintage only once and under one standard only. The project developer confirms that the project developer has not or will not issue both a CER and a GSVER for the same vintage from the project that is registered under GS4GG, in compliance with paragraph 2.1.3 of Annex B of GHG Emissions Reductions Sequestration Product Requirements.

B.1.1 Forward Action Requests

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Not Applicable

B.2. Post-Design Certification changes

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B.2.1. Temporary deviations from the approved Monitoring & Reporting Plan, methodology, or standardized baseline

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Not Applicable

B.2.2. Corrections

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Not Applicable

B.2.3. Changes to the start date the of crediting period

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Not Applicable

B.2.4. Permanent changes from the Design Certified monitoring plan, applied methodology, or applied standardized baseline.

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Not Applicable

B.2.5. Changes to project design of approved project

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Not Applicable

SECTION C. DESCRIPTION OF MONITORING SYSTEM APPLIED BY THE PROJECT

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BBF is the implementer for all VPAs included in the concerned monitoring period. Thus, all VPAs included in the monitoring report follow the same management system.

The partner organizations / entrepreneurs (PO/PEs) developed by BBF are responsible for manufacturing, sales and installation of Bondhu Chulas. The training of the user on how to operate and maintain the Bondhu Chula is provided by the PO/PEs as well by the promotional volunteers of BBF. Physical maintenance of the Bondhu Chula is undertaken by the PO/PEs and its associated technicians at a marginal fee from the user, depending on the nature of maintenance.

Each Bondhu Chulha carries a unique serial number. Information on details about the user, serial number of stove and the installation date is recorded at the time of installation of the stove by the PO/PEs technicians. For all VPAs included in the Monitoring Report, the information collected by PO/PEs technicians is transferred to its BBF's Office – where they are QA/QC'ed to eliminate any double counting or and/or incomplete, invalid entries. BBF maintains a summary of all installations in an electronic format. This PoA level database, containing stove and user records is maintained and updated regularly.

Data on other ex-post parameters, including operational performance of Bondhu Chulha, continued usage of baseline Chulha, etc are recorded objectively during sample

surveys conducted annually. For the current monitoring period, sampling was done at a PoA level (across multiple VPAs) using 95/10 as confidence/precision. Monitoring consisted of checking the representative samples against monitoring plan parameters using a questionnaire-based survey. The survey was conducted by BBF to collect feedback from sampled households. The data collected was transferred into excel sheet for analysis and calculation of emission reductions. The CME is responsible for developing the Monitoring Report; and for ensuring adherence to the monitoring procedures set in the monitoring plan.

The data recorded at the time of installation, as well as that collected through sampling surveys are transferred onto the emission reduction calculation workbook. For results of the ER calculations, refer VER calculation sheet.

SECTION D. DATA AND PARAMETERS

D.1. Data and parameters fixed ex ante or at renewal of crediting period

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SDG Indicator	SDG 1: No Poverty
Data/parameter	HHS _{Baseline}
Unit	Taka/Year
Description	Average household savings/reduced expenditure on basic services in baseline
Source of data	--
Value(s) applied	0
Choice of data or Measurement methods and procedures	--
Purpose of data	SDG 1 Impact calculation
Additional comment	--

SDG Indicator	SDG 5: Gender Equality
Data/parameter	TS _{Baseline}
Unit	Hrs/HH/day
Description	Average time saving associated with cooking and/or fuel collection time in baseline
Source of data	--
Value(s) applied	0
Choice of data or Measurement methods and procedures	--
Purpose of data	SDG 5 Impact calculation

Additional comment	--
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SDG Indicator	SDG 7: Affordable and Clean Energy
Data/parameter	ACS _{Baseline}
Unit	%
Description	Access to affordable and clean energy (% of operating ICS units under Baseline)
Source of data	--
Value(s) applied	0
Choice of data or Measurement methods and procedures	--
Purpose of data	SDG 7 Impact calculation
Additional comment	--

SDG Indicator	SDG 7: Affordable and Clean Energy
Data/parameter	NBH _{Baseline}
Unit	Number
Description	Total number of beneficiaries (unique households) that were provided access to clean fuels and technologies for domestic cooking in baseline
Source of data	--
Value(s) applied	0
Choice of data or Measurement methods and procedures	--
Purpose of data	SDG 7 Impact calculation
Additional comment	--

SDG Indicator	SDG 8: Decent Work and Economic Growth
Data/parameter	TJ _{Baseline}
Unit	Number
Description	Total Number of jobs (male and female) created under Baseline by project activity
Source of data	-
Value(s) applied	0
Choice of data or Measurement methods and procedures	-

Purpose of data	SDG 8 Impact calculation
Additional comment	-

SDG Indicator	SDG 15: Life on Land
Data/parameter	NRFC _{Baseline}
Unit	Tonnes of NRB /HH /year
Description	amount of non-renewable fuel consumption per HH in Baseline
Source of data	Calculated
Value(s) applied	1.81
Choice of data or Measurement methods and procedures	Calculated as $NRFC_{Baseline} = B_{old,i,j} * f_{NRB,y}$ Wherein, $B_{old,i,j}$ and $f_{NRB,y}$ are ex-ante fixed parameters
Purpose of data	SDG 15 Impact calculation
Additional comment	-

SDG Indicator	SDG 13: Climate Action
Data/parameter	B _{old,p}
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 08
Value(s) applied	0.5
Choice of data or Measurement methods and procedures	Default value as prescribed by methodology applied
Purpose of data	To calculate baseline emissions
Additional comment	-

SDG Indicator	SDG 13: Climate Action
Data/parameter	N _{p,HH}
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 ⁶
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	-

SDG Indicator	SDG 13: Climate Action
Data/parameter	$B_{old,HH}$
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
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 emissions
Additional comment	Further as VPA IMPLEMENTER plans distribution of only one ICS unit per household, $B_{old,HH} = B_{old,i,j}$

SDG Indicator	SDG 13: Climate Action
Data/parameter	$\eta_{old,i,j}$
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	AMS-II. G version 08

⁶ https://www.unicef.org/bangladesh/media/3281/file/Bangladesh%202019%20MICS%20Report_English.pdf

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 <table><tr><th>Description</th><th>Values</th><th>Source</th></tr><tr><td>Population using Three Stone Fire / conventional stoves</td><td>90%</td><td>Country Action plan for clean cookstoves, Nov 2013</td></tr><tr><td>Population using other baseline Cookstoves</td><td>10%</td><td>Calculated (100% - 90%)</td></tr><tr><td>Efficiency of Three Stone Fire Stove conventional stoves</td><td>10%</td><td rowspan="2">AMS II.G. default value</td></tr><tr><td>Efficiency of other baseline Cookstoves</td><td>20%</td></tr><tr><td>Weighted average baseline stove efficiency</td><td>11.00%</td><td>Calculated</td></tr></table>	Description	Values	Source	Population using Three Stone Fire / conventional stoves	90%	Country Action plan for clean cookstoves, Nov 2013	Population using other baseline Cookstoves	10%	Calculated (100% - 90%)	Efficiency of Three Stone Fire Stove conventional stoves	10%	AMS II.G. default value	Efficiency of other baseline Cookstoves	20%	Weighted average baseline stove efficiency	11.00%	Calculated
Description	Values	Source																
Population using Three Stone Fire / conventional stoves	90%	Country Action plan for clean cookstoves, Nov 2013																
Population using other baseline Cookstoves	10%	Calculated (100% - 90%)																
Efficiency of Three Stone Fire Stove conventional stoves	10%	AMS II.G. default value																
Efficiency of other baseline Cookstoves	20%																	
Weighted average baseline stove efficiency	11.00%	Calculated																
Purpose of data	To calculate baseline emissions																	
Additional comment	-																	

SDG Indicator	SDG 13: Climate Action
Data/parameter	$f_{NRB,y}$
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	fixed ex-ante at VPA level
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 emissions
Additional comment	-

SDG Indicator	SDG 13: Climate Action
Data/parameter	NCV _{biomass}

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 version 08
Value(s) applied	0.015
Choice of data or Measurement methods and procedures	The default value as prescribed by methodology applied
Purpose of data	To calculate baseline emissions
Additional comment	-

SDG Indicator	SDG 13: Climate Action
Data/parameter	EF _{projected_fossilfuel}
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 version 8 equation (2), page 5
Value(s) applied	81.6
Choice of data or Measurement methods and procedures	Default values prescribed by the methodology applied
Purpose of data	To calculate baseline emissions
Additional comment	-

SDG Indicator	SDG 13: Climate Action
Data/parameter	LAF _y
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	Default value as prescribed by methodology applied
Purpose of data	To calculate baseline emissions
Additional comment	-

D.2 Data and parameters monitored

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SDG Indicator	SDG 1: No Poverty						
Data/parameter	HHS _{Project}						
Unit	Taka/Year						
Description	Average household savings/reduced expenditure on basic services due to the adoption of project technology i.e., improved cookstove						
Source of data	Ex-post monitoring surveys						
Value(s) applied	<table border="1"> <thead> <tr> <th>VPA→</th><th>GS 11571 & GS 11572</th></tr> </thead> <tbody> <tr> <td>MS1</td><td>4,674</td></tr> <tr> <td>MS2</td><td>5,147</td></tr> </tbody> </table>	VPA→	GS 11571 & GS 11572	MS1	4,674	MS2	5,147
VPA→	GS 11571 & GS 11572						
MS1	4,674						
MS2	5,147						
Measurement methods and procedures	Determined via ex-post monitoring over a sample of project ICS users using a survey questionnaire providing options for range of money savings. The monitoring data collected, thus, is a grouped frequency table (with various groups representing different money saving range and frequency representing number of samples reporting corresponding money savings). The weighted average is then determined using the midpoint of each group range, weighing to the reported frequency.						
Monitoring frequency	Annual / Biennial						
QA/QC procedures	Surveys was conducted by trained/experienced staff						
Purpose of data	SDG 1 Impact calculation						
Additional comment	-						

SDG Indicator	SDG 5: Gender Equality						
Data/parameter	TS _{Project}						
Unit	Hrs/HH/day						
Description	Average time saving associated with cooking and/or fuel collection time in project						
Source of data	Ex-post monitoring surveys						
Value(s) applied	<table border="1"> <thead> <tr> <th>VPA→</th><th>GS 11571 & GS 11572</th></tr> </thead> <tbody> <tr> <td>MS1</td><td>2.24</td></tr> <tr> <td>MS2</td><td>2.34</td></tr> </tbody> </table>	VPA→	GS 11571 & GS 11572	MS1	2.24	MS2	2.34
VPA→	GS 11571 & GS 11572						
MS1	2.24						
MS2	2.34						
Measurement methods and procedures	Determined via ex-post monitoring over a sample of project ICS users using a survey questionnaire providing options for range of time savings.						

	The monitoring data collected, thus, is a grouped frequency table (with various groups representing different time saving range and frequency representing number of samples reporting corresponding time savings). The weighted average is then determined using the midpoint of each group range, weighing to the reported frequency.
Monitoring frequency	Annual / Biennial
QA/QC procedures	Surveys was conducted by trained/experienced staff
Purpose of data	SDG 5 Impact calculation
Additional comment	-

SDG Indicator	SDG 7: Affordable and Clean Energy										
Data/parameter	NBH _{Project}										
Unit	Number										
Description	Total number of beneficiaries (unique households) that were provided access to clean fuels and technologies for domestic cooking in project										
Source of data	ICS distribution records										
Value(s) applied	<table border="1"> <tr> <th>VPA→</th><th>GS 11571</th><th>GS 11572</th></tr> <tr> <td>MS1</td><td>499,804</td><td>499,804</td></tr> <tr> <td>MS2</td><td>499,804</td><td>499,804</td></tr> </table>		VPA→	GS 11571	GS 11572	MS1	499,804	499,804	MS2	499,804	499,804
VPA→	GS 11571	GS 11572									
MS1	499,804	499,804									
MS2	499,804	499,804									
Measurement methods and procedures	-										
Monitoring frequency	Continuous										
QA/QC procedures	-										
Purpose of data	SDG 7 Impact calculation										
Additional comment	-										

SDG Indicator	SDG 7: Affordable and Clean Energy							
Data/parameter	ACS _{Project}							
Unit	%							
Description	Access to affordable and clean energy (% of operating ICS units under Project)							
Source of data	Ex-post monitoring surveys							
Value(s) applied	<table><tr><td>VPA→</td><td>GS 11571 & GS 11572</td></tr><tr><td>MS1</td><td>98.48</td></tr><tr><td>MS2</td><td>96.34</td></tr></table>		VPA→	GS 11571 & GS 11572	MS1	98.48	MS2	96.34
VPA→	GS 11571 & GS 11572							
MS1	98.48							
MS2	96.34							
Measurement methods and procedures	Not applicable							
Monitoring frequency	Annual / Biennial							

QA/QC procedures	Surveys was conducted by trained/experienced staff
Purpose of data	SDG 7 Impact calculation
Additional comment	-

SDG Indicator	SDG 8: Decent Work and Economic Growth											
Data/parameter	TJ _{Project}											
Unit	Number											
Description	Total Number of jobs (male and female) created under Project-by-project activity											
Source of data	HR records/ Sales and marketing records											
Value(s) applied	All reported employees are permanent employees. <table><tr><td>VPA→</td><td colspan="2">GS 11571 & GS 11572</td></tr><tr><td>MS1</td><td>1070 Male</td><td>380 Female</td></tr><tr><td>MS2</td><td>1150 Male</td><td>450 Female</td></tr></table>			VPA→	GS 11571 & GS 11572		MS1	1070 Male	380 Female	MS2	1150 Male	450 Female
VPA→	GS 11571 & GS 11572											
MS1	1070 Male	380 Female										
MS2	1150 Male	450 Female										
Measurement methods and procedures	Not applicable											
Monitoring frequency	Annual/ Biennial											
QA/QC procedures	--											
Purpose of data	SDG 8 Impact calculation											
Additional comment	--											

SDG Indicator	SDG 15: Life on Land						
Data/parameter	NRFC _{Project}						
Unit	Tonnes of NRB/HH/year						
Description	Amount of non-renewable fuel consumption per HH in Project						
Source of data	Calculated						
Value(s) applied	<table border="1"> <tr> <th>VPA→</th><th>GS 11571 & GS 11572</th></tr> <tr> <td>MS1</td><td>0.658</td></tr> <tr> <td>MS2</td><td>0.664</td></tr> </table>	VPA→	GS 11571 & GS 11572	MS1	0.658	MS2	0.664
VPA→	GS 11571 & GS 11572						
MS1	0.658						
MS2	0.664						
Measurement methods and procedures	$NRFC_{Project} = NRFC_{Baseline} * \frac{\eta_{old}}{\eta_{new,i,j}}$ Wherein: η_{old} has been fixed ex-ante $\eta_{new,i,j}$ was monitored as per section B.5.1 of the CDM CPA-DD						
Monitoring frequency	Annual / Biennial						
QA/QC procedures	--						
Purpose of data	SDG 15 Impact calculation						
Additional comment	--						

SDG Indicator	SDG 13: Climate Action											
Data/parameter	N _{y,i,j}											
Unit	Number											
Description	Number of project devices of type i and batch j operating during year y											
Source of data	Sales Record and monitoring survey											
Value(s) applied	<table><tr><td>VPA →</td><td>GS 11571</td><td>GS 11572</td></tr><tr><td>MS1</td><td>492,183</td><td>492,183</td></tr><tr><td>MS2</td><td>481,536</td><td>481,536</td></tr></table>			VPA →	GS 11571	GS 11572	MS1	492,183	492,183	MS2	481,536	481,536
VPA →	GS 11571	GS 11572										
MS1	492,183	492,183										
MS2	481,536	481,536										
Measurement methods and procedures	The VPA implementer is maintaining database of all the ICS installed. A usage monitoring survey was conducted to determine the number of operating stoves of type i and batch j on a sampling basis. The formula used to calculate the monitored value of operational ICS of type i and batch j is as follows: $N_{y,i,j} = (n_{i,j,operational} / n_{i,j,total}) * N_{y,i,j,installed}$ Where: N = total number of stoves in population n = number of samples monitored											
Monitoring frequency	Annual/Biennial											
QA/QC procedures	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 07.0											
Purpose of data	To calculate baseline emissions											
Additional comment	--											

SDG Indicator	SDG 13: Climate Action						
Data/parameter	μ_y						
Unit	Fraction						
Description	Adjustment to account for any continued use of pre-project devices during the year y						
Source of data	Monitoring survey						
Value(s) applied	<table border="1"> <thead> <tr> <th>VPA →</th><th>GS 11571 & GS 11572</th></tr> </thead> <tbody> <tr> <td>MS1</td><td>1.000</td></tr> <tr> <td>MS2</td><td>1.000</td></tr> </tbody> </table>	VPA →	GS 11571 & GS 11572	MS1	1.000	MS2	1.000
VPA →	GS 11571 & GS 11572						
MS1	1.000						
MS2	1.000						
Measurement methods and procedures	The sampled households were 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, has been 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)
Monitoring frequency	Annual/ Biennial
QA/QC procedures	The parameter is determined based on sample surveys. The sample size is such determined to yield results with 95/10 confidence/precision.
Purpose of data	To calculate baseline emissions
Additional comment	--

SDG Indicator	SDG 13: Climate Action																									
Data/parameter	$\eta_{new,i,j}$																									
Unit	Fraction																									
Description	Efficiency of the project device of each type i and batch j																									
Source of data	WBT test records																									
Value(s) applied	<table><tr><th>$\eta_{new,i,j}$</th><th>Monitored Value</th><th>Source (in line with para 25 of the methodology)</th></tr><tr><td>$\eta_{new, 1 Pot, 2020, MS1}$</td><td>0.3312</td><td rowspan="2">Based on rated efficiency and efficiency loss for age 2 ICSs established in MP3 . Refer MP3 MR, page 11 of 21, available at: https://cdm.unfccc.int/UserManagement/FileStorage/UB8O36I5XVYQ1KD9702MAHJPLRTZWG</td></tr><tr><td>$\eta_{new, 2 Pot, 2020, MS1}$</td><td>0.3340</td></tr><tr><td>$\eta_{new, 1 Pot, 2021 MS1}$</td><td>0.3331</td><td rowspan="2">Based on rated efficiency and efficiency loss for age 1 ICSs established in MP2 (in line with para 25 of the methodology). Refer MP2 MR, page 11 of 21, available at: https://cdm.unfccc.int/UserManagement/FileStorage/IJ5U1WC749TL6NHODQFKMEV20RAS3</td></tr><tr><td>$\eta_{new, 2 Pot, 2021, MS1}$</td><td>0.3375</td></tr><tr><td>$\eta_{new, 1 Pot, 2020, MS2}$</td><td>0.3260</td><td rowspan="2">Based on rated efficiency and efficiency loss for age 3 ICSs established in MP4 (in line with para 25 of the methodology). Refer MP4 MR, page 11 of 21, available at: https://cdm.unfccc.int/UserManagement/FileStorage/71G3TVO6AEX59L8MIZNBQDF2JWHP40</td></tr><tr><td>$\eta_{new, 2 Pot, 2020, MS2}$</td><td>0.3292</td></tr><tr><td>$\eta_{new, 1 Pot, 2021, MS2}$</td><td>0.3312</td><td rowspan="2">Based on rated efficiency and efficiency loss for age 2 ICSs established in MP3 (in line with para 25 of the methodology). Refer MP3 MR, page 11 of 21, available at: https://cdm.unfccc.int/UserManagement/FileStorage/UB8O36I5XVYQ1KD9702MAHJPLRTZWG</td></tr><tr><td>$\eta_{new, 2 Pot, 2021, MS2}$</td><td>0.3340</td></tr></table>			$\eta_{new,i,j}$	Monitored Value	Source (in line with para 25 of the methodology)	$\eta_{new, 1 Pot, 2020, MS1}$	0.3312	Based on rated efficiency and efficiency loss for age 2 ICSs established in MP3 . Refer MP3 MR, page 11 of 21, available at: https://cdm.unfccc.int/UserManagement/FileStorage/UB8O36I5XVYQ1KD9702MAHJPLRTZWG	$\eta_{new, 2 Pot, 2020, MS1}$	0.3340	$\eta_{new, 1 Pot, 2021 MS1}$	0.3331	Based on rated efficiency and efficiency loss for age 1 ICSs established in MP2 (in line with para 25 of the methodology). Refer MP2 MR, page 11 of 21, available at: https://cdm.unfccc.int/UserManagement/FileStorage/IJ5U1WC749TL6NHODQFKMEV20RAS3	$\eta_{new, 2 Pot, 2021, MS1}$	0.3375	$\eta_{new, 1 Pot, 2020, MS2}$	0.3260	Based on rated efficiency and efficiency loss for age 3 ICSs established in MP4 (in line with para 25 of the methodology). Refer MP4 MR, page 11 of 21, available at: https://cdm.unfccc.int/UserManagement/FileStorage/71G3TVO6AEX59L8MIZNBQDF2JWHP40	$\eta_{new, 2 Pot, 2020, MS2}$	0.3292	$\eta_{new, 1 Pot, 2021, MS2}$	0.3312	Based on rated efficiency and efficiency loss for age 2 ICSs established in MP3 (in line with para 25 of the methodology). Refer MP3 MR, page 11 of 21, available at: https://cdm.unfccc.int/UserManagement/FileStorage/UB8O36I5XVYQ1KD9702MAHJPLRTZWG	$\eta_{new, 2 Pot, 2021, MS2}$	0.3340
$\eta_{new,i,j}$	Monitored Value	Source (in line with para 25 of the methodology)																								
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$\eta_{new, 2 Pot, 2021, MS2}$	0.3340																									

Measurement methods and procedures	--
Monitoring frequency	Annual
QA/QC procedures	The tests were conducted by trained staff having prior experience of conducting WBTs
Purpose of data	Calculation of baseline emissions
Additional comment	--

D.3. Comparison of monitored parameters with last monitoring period

Data/ Parameter	Value obtained in this monitoring period			Value obtained last monitoring period		
HHS _{Project}	VPA→	GS 11571 & GS 11572		NA		
	MS1	4,674				
	MS2	5,147				
TS _{Project}	VPA→	GS 11571 & GS 11572		NA		
	MS1	2.24				
	MS2	2.34				
ACS _{Project}	VPA→	GS 11571 & GS 11572		NA		
	MS1	98.48				
	MS2	96.34				
NBH _{Project}	VPA→	GS 11571	GS 11572	NA		
	MS1	499,804	499,804			
	MS2	499,804	499,804			
TJ _{Project}	VPA→	GS 11571 & GS 11572		NA		
	MS1	1,450				
	MS2	1,600				
NRFC _{Project}	VPA→	GS 11571 & 11572		NA		
	MS1	0.658				
	MS2	0.664				
N _{y,i,j}	VPA →	GS 11571	GS 11572	GS 11571	GS 11572	
	MS1	492,183	492,183	135,532	135,533	
	MS2	481,536	481,536			
η _{new,i,j}	ICS Age	Thermal Efficiency (fraction)		ICS Age	Thermal Efficiency (fraction)	
		1 Pot	2 Pot		1 Pot	2 Pot
	Age 3	0.3260	0.3292	Age 3	0.3260	0.3292
	Age 2	0.3312	0.3340	Age 2	0.3312	0.3340
	Age 1	0.3331	0.3375	Age 1	0.3331	0.3375
μ _y	VPA →	GS 11571 & 11572		1.000		
	MS1	1.000				
	MS2	1.000				

Monitored Operating Fraction

Model, Vintage	MS1	MS2
1 Pot, 2020	0.9286	0.9167
2 Pot, 2020	1.0000	1.0000
1 Pot, 2021	1.0000	0.9643
2 Pot, 2021	1.0000	1.0000

Model, Vintage	CDM last MP
1 Pot, 2020	0.93
2 Pot, 2020	1.00

The increase in parameter $N_{y,i,j}$ is attributed to progressive sales under the VPA over time. In the last MP, the ICS installed till Dec 2020 were reported while the current MP has ICS installed till Nov 2021. Thus, no parameter (as reported above) has increased or is less conservative than that reported in last MP under CDM.

D.4. Implementation of sampling plan

>>

A single sampling plan was carried out for VPAs covered in this monitoring report.

The number of units installed under the CPAs is as follows:

VPA GS ID	Type of ICS eligible under VPA	Total number of ICS in the VPA	VPA monitoring period covered under this PoA monitoring period
GS 11571	Wood fuel	499,804	01-01-2021 to 31-12-2022 (both days inclusive)
GS 11572	Wood fuel	499,804	

a) Description of implemented single sampling design;

Due to the large number of ICS installed under the CPA it was not economically feasible to monitor each individual ICS unit installed, therefore, a representative sampling was undertaken as part of the cross CPA Sampling Plan. The Sampling Standard version 08.0 (paragraph 23) mandates application of 95/10 confidence/precision for VPAs solely composed of micro-scale CDM units hence the same was applied as a conservative measure despite the methodology taking precedence.

The objective of the sampling was to obtain an unbiased and reliable estimate of the proportion or mean value of the following parameters over the course of the monitoring period, and with 95/10 confidence/precision. The 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

The target population is the total ICS population served under the VPA (and covered under the monitoring report), and the sampling frame consists of aggregated data of end-users of the ICS as recorded in the VPA Databases.

The sampling was conducted using stratified random sampling technique over the sampling frame. The ICS in the sampling frame were stratified by ICS model *i* (1 pot or 2 pot) and batch *j* i.e. year of installation (2020 and 2021). Thus, the population was categorized into applicable sampling strata for identifying samples for various monitoring parameters, as applicable. The sample size was calculated as per section B.5.2 of the registered CPA-DD. The expected parameter values (mean, standard deviation and proportion) have been determined based on project developer's knowledge and experience as per para 13(b) and 13(c) of the Sampling and surveys for CDM project activities and programmes of activities, version 08.0

Parameter	Total population n (N)	Expected results	Reliability	Sample Size (n) required	Samples covered during monitoring
N _{y,1 pot, 2020, MS1}	213394	0.870 (proportion)	95/10	10	14
N _{y,2 pot, 2020, MS1}	71897	0.870 (proportion)	95/10	4	9
N _{y,1 pot, 2021, MS1}	525088	0.900 (proportion)	95/10	25	27
N _{y,2 pot, 2021, MS1}	189229	0.900 (proportion)	95/10	9	13
N _{y,1 pot, 2020, MS2}	213394	0.870 (proportion)	95/10	10	12
N _{y,2 pot, 2020, MS2}	71897	0.870 (proportion)	95/10	4	8
N _{y,1 pot, 2021, MS2}	525088	0.900 (proportion)	95/10	25	28
N _{y,2 pot, 2021, MS2}	189229	0.900 (proportion)	95/10	9	13
μ _{y,1 pot, MS1}	738482	0.90 (proportion)	95/10	32	40
μ _{y,2 pot, MS1}	261126	0.90 (proportion)	95/10	12	22
μ _{y,1 pot, MS2}	738482	0.90 (proportion)	95/10	32	38
μ _{y,2 pot, MS2}	261126	0.90 (proportion)	95/10	12	21

The sample size is determined using the following formulas:

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

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)

$$V = \frac{SD^2}{p}$$

Where

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

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

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

Where

SD_i = expected standard deviation of strata i in the population

m_i = expected mean of strata i in the population

Each ICS in the target strata, uniquely identifiable by its Stove ID number, was allocated a sample number, starting at 1 and increasing up to the total number of ICS in the strata (1 Pot₂₀₂₀: 1 to 213,394, 2 Pot₂₀₂₀: 1 to 71,897, 1 Pot₂₀₂₁: 1 to 525,088 and 2 Pot₂₀₂₁: 1 to 189,229. Random numbers were generated (using online random number generator and the numbers obtained were used to identify the samples from the corresponding strata for monitoring. Slightly higher number of samples were selected for monitoring than that required, to ensure that the desired precision / confidence is achieved as well as have cover for no-responses. The following tables demonstrate the sample size determined:

Monitoring parameter(s)		Stove Operating Fraction for determination of $N_{v,i,j}$				
Sampling frame(s)		Given stove model and vintage population				
Sampling approach		Stratified random sampling across stove model and vintage				
Stove Type	Year	Stove population	MS1		MS2	
			Expected operational proportion (SoF)	Calculated Sample Size (n)	Expected operational proportion (SoF)	Calculated Sample Size (n)
1 Pot	2020	213394	0.870	10	0.870	10
2 Pot	2020	71897	0.870	4	0.870	4
1 Pot	2021	525088	0.900	25	0.900	25
2 Pot	2021	189229	0.900	9	0.900	9
Sample size determination			MS1		MS2	
Estimated SOF (p)			0.89		0.89	
Estimated Standard Deviation of SOF (SD)			0.31		0.31	
$V_{SOF} = (SD/p)^2$			0.12		0.12	
Sample Size required (SOF)			47		47	
Monitoring parameter(s)		Utilization of Project stoves - μ_y				
Sampling frame(s)		Given stove model population				
Sampling approach		Stratified random sampling across stove models				
Sampling Population (i)	Stove population	MS1		MS2		
		Expected value	Calculated Sample Size (n)	Expected value	Calculated Sample Size (n)	
1 Pot	738482	0.90	32	0.90	32	
2 Pot	261126	0.90	12	0.90	12	
Sample size determination		MS1		MS2		
Estimated utilization (p)		0.90		0.90		
$V_{Utilization} = p(1-p)/p^2$		0.11		0.11		
Minimum Sample Size required		43		43		

b) Collected data (electronic spreadsheets may be attached and referenced).

Data was collected for $N_{y,i,j}$ and μ_y following an especially designed survey form. The information collected was introduced into an electronic database, the PoA Monitoring Records. The survey forms were designed to allow the surveyor to collect the necessary information from the field visit for the ER calculations.

The MS#1 (Monitoring Surveys) were conducted in Jan 2022 and the MS#2 (Monitoring Surveys) were conducted in Jan 2023.

c) Analysis of the collected data;

Analysis of the data monitored through sampling revealed the following results:

Sampling Constants	MS1	MS2
Monitoring period start	01-01-2021	01-01-2022
Monitoring period end	31-12-2021	31-12-2022
Level of Sampling	PoA	PoA
Confidence (%) (90 or 95)	95%	95%
Margin of Error (%)	10%	10%
Z value	1.960	1.960

Monitoring parameter(s)			Stove Operating Fraction for determination of $N_{y,i,j}$			
Monitoring results			MS1		MS2	
Stove Type	Year	Sampling frame size	Monitored Sample Count($n_{i,j,total}$)	Monitored Operating Fraction ($n_{i,j,operationao}/n_{i,j,total}$)	Monitored Sample Count($n_{i,j,total}$)	Monitored Operating Fraction ($n_{i,j,operationao}/n_{i,j,total}$)
1 Pot	2020	213394	14	0.9286	12	0.9167
2 Pot	2020	71897	9	1.0000	8	1.0000
1 Pot	2021	525088	27	1.0000	28	0.9643
2 Pot	2021	189229	13	1.0000	13	1.0000
Reliability Check			MS1		MS2	
Samples Monitored			63		61	
SoF Measured			0.9848		0.9634	
Standard Error of SoF			1.47%		2.51%	
Relative precision (Margin of error)			2.92%		5.10%	
Result			Ok, reliability level met		Ok, reliability level met	
Lower Bound confidence value			Not applicable		Not applicable	
Monitoring parameter(s)		Utilization of Project stoves - μ_y				
Monitoring results		MS1		MS2		
Sampling Population	Sampling frame size	Monitored Sample Size	Monitored Utilization	Monitored Sample Size	Monitored Utilization	
1 Pot	738482	40	1.00	38	1.00	
2 Pot	261126	22	1.00	21	1.00	
Reliability Check		MS1		MS2		
Samples Monitored		62		59		
Utilization Measured		1.00		1.00		
Standard Error of Utilization		0.00%		0.00%		
Relative precision (Margin of error)		0.00%		0.00%		
Result		Ok, reliability level met		Ok, reliability level met		
Lower Bound confidence value		Not applicable		Not applicable		

For detailed calculations refer ER calculator, worksheet 'Monitoring Survey'.

d) Demonstration of whether the required confidence/precision has been met.

The VER calculation spreadsheet contains calculation of relative precision. Since the relative margin of error obtained is less than 10%, the data are statistically acceptable and deemed representative of the population.

e) Demonstration of whether the samples were randomly selected and are representative of the population.

ICSs were selected randomly after arranging them in chronological order of date of sale and assigning a sampling number to each ICS in each strata. Random numbers were generated using online random number generator available at <http://stattrek.com/statistics/random-number-generator.aspx> separately for each strata and the ICS corresponding to random number received were selected from sampling strata for monitoring. The approach ensured that each ICS in the sampling strata and the target population had equal chances of being selected and the samples picked represent the ICS population.

SECTION E. CALCULATION OF SDG IMPACTS

E.1. Calculation of baseline value or estimation of baseline situation of each SDG Impact

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SDG	SDG Impact	Baseline estimate
1	No Poverty	0
SDG	SDG Impact	Baseline estimate
5	Gender Equality	0
SDG	SDG Impact	Baseline estimate
7	Affordable and Clean Energy (% of operating ICS)	0
7	Affordable and Clean Energy (Number of systems installed)	0
SDG	SDG Impact	Baseline estimate
8	Decent Work and Economic Growth	0
SDG	SDG Impact	Baseline estimate
15	Life on Land	1.81
SDG	SDG Impact	Baseline estimate
13	Climate Action	0

For detailed/sample calculation, please refer ER calculator.

E.2. Calculation of project value or estimation of project situation of each SDG Impact

>>

SDG	SDG Impact	Project estimate		
1	No Poverty (Average household savings/reduced expenditure on basic services)	VPA→	GS 11571 & GS 11572	
		MS1	4,674	
		MS2	5,147	
SDG	SDG Impact	Project estimate		
5	Gender Equality (Average time saving)	VPA→	GS 11571 & GS 11572	
		MS1	2.24	
		MS2	2.34	
SDG	SDG Impact	Project estimate		
7	Affordable and Clean Energy (% of operating ICS)	VPA→	GS 11571 & GS 11572	
		MS1	98.48	
		MS2	96.34	
7	Affordable and Clean Energy (Number of systems installed)	VPA→	GS 11571	GS 11572
		MS1	499,804	499,804
		MS2	499,804	499,804

SDG	SDG Impact	Project estimate	
8	Decent Work and Economic Growth	VPA→	GS 11571 & GS 11572
		MS1	1,450
		MS2	1,600

SDG	SDG Impact	Project estimate	
15	Life on Land	VPA→	GS 11571 & 11572
		MS1	0.658
		MS2	0.664

SDG	SDG Impact	Project estimate		
13	Climate Action	VPA →	GS 11571	GS 11572
		MS1	468,151	468,152
		MS2	677,123	677,123

For detailed/sample calculation, please refer ER calculator.

E.3. Calculation of leakage

>>

The Net to Gross Leakage Adjustment Factor has already been included in the emission reduction calculations as explained above, hence this is not applicable.

E.4. Calculation of net benefits or direct calculation for each SDG Impact

For SDG 1: No Poverty

Net Benefit (SDG 1) = $HHS_{Project} - HHS_{Baseline}$

Where:

$HHS_{Baseline}$ Average household savings/reduced expenditure on basic services in baseline

$HHS_{Project}$ Average household savings/reduced expenditure on basic services due to the adoption of project technology i.e., improved cookstove

For SDG 5: Gender Equality

Ex-post Monitoring Surveys Records

Net Benefit (SDG 5) = $TS_{Project} - TS_{Baseline}$

Where:

$TS_{Baseline}$ Average time saving associated with cooking and/or fuel collection time in baseline.

$TS_{Project}$ Average time saving associated with cooking and/or fuel collection time in project.

For SDG 7: Affordable and Clean Energy

Net Benefit (SDG 7) = $ACS_{Project} - ACS_{Baseline}$

Where:

$ACS_{Baseline}$ Access to affordable and clean energy (% of operating ICS units under Baseline)

ACS_{Project} Access to affordable and clean energy (% of operating ICS units under Project)

Net Benefit (SDG 7) = NBH_{Project} - NBH_{Baseline}

Where:

NBH_{Baseline} Total number of beneficiaries (unique households) that were provided access to clean fuels and technologies for domestic cooking in baseline

NBH_{Project} Total number of beneficiaries (unique households) that were provided access to clean fuels and technologies for domestic cooking in project

For SDG 8: Decent Work and Economic Growth

Net Benefit (SDG 8) = TJ_{Project} - TJ_{Baseline}

Where:

TJ_{Baseline} Total Number of jobs (male and female) created under Baseline by project activity.

TJ_{Project} Total Number of jobs (male and female) created under Project-by-project activity

For SDG 15: Life on Land

Ex-post Monitoring Survey / Tests Records

Net Benefit (SDG 15) = NRFC_{Baseline} - NRFC_{Project}

Where:

NRFC_{Baseline} amount of non-renewable fuel consumption per HH in Baseline

NRFC_{Project} amount of non-renewable fuel consumption per HH in Project

For SDG 13: Climate Action

Sample Calculation:

The methodology directly provides equation for emission reductions (without separate baseline, projector leakage emission reduction equations).

As per the methodology, and the PoA-DD, emission reductions are calculated as:

$$ER_y = \sum_i \sum_j ER_{y,i,j} - LE_y$$

Where

i = Indices for the situation where more than one type of project device is introduced to replace the pre-project devices

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

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

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).

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

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;

LAF_y = Net to Gross Leakage adjustment factor

$$B_{old,i,j} = B_{old,HH} = B_{old,p} \times N_{p,HH}$$

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 devices

$B_{old,p}$ = 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.

SDG	SDG Impact	Baseline estimate	Project estimate		Net benefit	
1	No Poverty	0	VPA→	GS 11571 & GS 11572	VPA→	GS 11571 & GS 11572
			MS1	4,674	MS1	4,674
			MS2	5,147	MS2	5,147

SDG	SDG Impact	Baseline estimate	Project estimate		Net benefit	
5	Gender Equality	0	VPA→	GS 11571 & GS 11572	VPA→	GS 11571 & GS 11572
			MS1	2.24	MS1	2.24
			MS2	2.34	MS2	2.34

SDG	SDG Impact	Baseline estimate	Project estimate		Net benefit	
7	Affordable and Clean Energy (% of operating ICS)	0	VPA→	GS 11571 & GS 11572	VPA→	GS 11571 & GS 11572
			MS1	98.48	MS1	98.48
			MS2	96.34	MS2	96.34

SDG	SDG Impact	Baseline estimate	Project estimate			Net benefit		
7	Affordable and Clean Energy (Number of systems installed)	0	VPA→	GS 11571	GS 11572	VPA→	GS 11571	GS 11572
			MS1	499,804	499,804	MS1	499,804	499,804
			MS2	499,804	499,804	MS2	499,804	499,804

SDG	SDG Impact	Baseline estimate	Project estimate		Net benefit	
8	Decent work and economic growth	0	VPA→	GS 11571 & GS 11572	VPA→	GS 11571 & GS 11572
			MS1	1,450	MS1	1,450
			MS2	1,600	MS2	1,600

SDG	SDG Impact	Baseline estimate	Project estimate		Net benefit	
15	Life on Land	1.812	VPA→	GS 11571-72	VPA→	GS 11571-72
			MS1	0.658	MS1	1.155
			MS2	0.664	MS2	1.148

SDG	SDG Impact	Baseline estimate	Project estimate			Net benefit ⁷	
13	Climate Action	0	VPA →	GS 11571	GS 11572	VPA →	GS 11571 GS 11572
			MS1	468,151	468,152	MS1	468,151 468,152
			MS2	677,123	677,123	MS2	677,123 677,123

For detailed/sample calculation, please refer ER calculator.

E.5. Comparison of actual SDG Impacts with estimates in approved PDD

SDG	Values estimated in ex ante calculation of approved PDD for this monitoring period		Actual values ⁸ achieved during this monitoring period	
13 Climate Action: Amount of CO ₂ emissions reduced				
VPA ID	MS1	MS2	MS1	MS2
GS 11571	2,566,211	2,851,346	468,151	677,123
GS 11572	2,566,211	2,851,346	468,152	677,123
Total	5,132,422	5,702,692	936,303	1,354,246

For detailed/sample calculation, please refer "Ex-ante Estimation" tab of the ER calculator.

E.5.1. Explanation of calculation of value estimated ex ante calculation of approved PDD for this monitoring period

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The ex-ante estimate per TRF for the monitoring period has been calculated as follows:

$$= \text{Ex-ante ER as per TRF (Section B.6.4)} * (\text{Number of Days monitored} / \text{No. of days in a year})$$

A sample calculation for VPA⁹:

$$= \text{Ex-ante ER for Year MS1}^{10} + \text{Ex-ante ER for Year MS2}$$

$$= 1,425,673 * 73^{11} / 365 + 2,851,346 * 365^{12} / 365 + 2,851,346 * 292^{13} / 365$$

⁷ VPAs will/has not issue both a CER/other compliance units under Paris Agreement and a GSVER for the same vintage. CME agrees to comply with all future UNFCCC COP/CMP decisions including adjustment to GWP values.

⁸ Whenever emission reductions are capped, both the original and capped values used for calculations must be transparently reported. Use brackets to denote original values.

⁹ For other VPAs, refer sheet "Monitoring report Table".

¹⁰ As per section B.6.2 of the registered TRF

¹¹ No. of Days monitored in Year 1 for MS1 = 14 Mar 2021 – 01 Jan 2021 + 1 = 73

¹² No. of Days monitored in Year 2 for MS1 and MS2 = 14 Mar 2022 – 15 Mar 2021 + 1 = 365

¹³ No. of Days monitored in Year 3 MS 2 = 31 Dec 2022 – 15 Mar 2022 + 1 = 292

= 5,417,557

E.6. Remarks on increase in achieved SDG Impacts from estimated value in approved PDD

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Not Applicable, the ERs are lower than ex-ante estimates in the approved PDD.

SECTION F. SAFEGUARDS REPORTING

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Not applicable as, no mitigation measures were identified during the safeguarding principle assessment at the VPA level.

Refer Transition Request Form Section D.

SECTION G. STAKEHOLDER INPUTS AND LEGAL DISPUTES

G.1. List all Inputs and Grievances which have been received via the Continuous Input and Grievance Mechanism together with their respective responses/mitigations.

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No negative comments received during the monitoring period.

G.2. Report on any stakeholder mitigations that were agreed to be monitored.

>>

Not applicable

G.3. Provide details of any legal contest that has arisen with the project during the monitoring period

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Not applicable, no legal contests occurred during the monitoring period.

APPENDIX 1

Entity responsible for completing the TEMPLATE- Monitoring Report	
Organization name	Climate Secure
Street/P.O. Box	Club Road
Building	Pragati Apartments
City	West Delhi
State/Region	Delhi
Postcode	110063
Country	India
E-mail	info@climate-secure.com
Website	www.climate-secure.com
Contact Person	<u>Rohit Lohia</u>

Revision History

Version	Date	Remarks
1.1	14 October 2020	Hyperlinked section summary to enable quick access to key sections Improved clarity on Key Project Information Section for POA monitoring Forward action request section Improved Clarity on SDG contribution/SDG Impact term used throughout Clarity on safeguard reporting Clarity on design changes Leakage section added for VER/CER projects Addition of Comparison of monitored parameters with last monitoring period Provision of an accompanying Guide to help the user understand detailed rules and requirements
1.0	10 July 2017	Initial adoption