

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

SECTION C - Description of monitoring system applied by the project

SECTION D - Data and parameters

SECTION E - Calculation of SDG Impacts

SECTION F - Safeguards Reporting

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KEY PROJECT INFORMATION

Programme of Activity Information – (delete below table if N/A)

GS ID of Programme	GS7776
Title of Programme	Improved cook stoves and sustainable charcoal initiative
Version of POA-DD applicable to this monitoring report	5
Name and GS ID of fully Validated CPA/VPAs (i.e. non compliance check)	GS10716: Improved cook stoves and sustainable charcoal initiative, CPA 1

Key Project Information

GS ID (s) of Project (s)	GS10716
Title of the project (s) covered by monitoring report	Improved cook stoves and sustainable charcoal initiative, CPA 1
Version number of the PDD/VPA-DD (s) applicable to this monitoring report	4
Version number of the monitoring report	2
Completion date of the monitoring report	25/06/2021
Date of project design certification	30/03/2021
Date of Last Annual Report	n.a.
Monitoring period number	1 and 2
Duration of this monitoring period	MP1: 26/06/2020 -31/08/2020 MP2: 01/09/2020 – 31/12/2020
Project Representative	Dr. Katrin Mikolajewski
Host Country	India
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. ver. 12 – Energy efficiency measures in thermal applications of non-renewable biomass

	AMS-III.BG. ver. 3 – Emission reduction through sustainable charcoal production and
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
1 End poverty in all its forms everywhere	Income for the households generated by the sales of the charcoal in INR.	MP1: 25,571,560 MP2: 61,969,512	INR per MP
7 Ensure access to affordable, reliable, sustainable and modern energy for all	Number of households using clean cooking devices such as Improved Cook Stoves.	MP1: 55,291 MP2: 82,589	Number per MP
8 Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all	The number of jobs created by the project activity.	MP1: 242 MP2: 278	Number per MP
13 Climate Action	Emission Reductions	MP1: 41,004 MP2: 93,378	tCO2e/MP

Table 2 – Product Vintages

		Amount Achieved		
Start Dates	End Dates	GS CERs	...	...
26/06/2020	31/08/2020	41,004	-	-
01/09/2020	31/12/2020	93,378	-	-

SECTION A. DESCRIPTION OF PROJECT

A.1. General description of project

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The project activity aims at reducing the fuel wood consumption and indoor air pollution of traditional stove users in West Bengal, India by disseminating Improved Cook Stoves (ICS) of the type micro gasifier stove at subsidized prices. In addition, the consumption of conventional charcoal by selected users of conventional charcoal may be reduced by providing them charcoal generated in the wood gasifier stoves as a by-product.

Technologies implemented by the VPA

The ICS implemented in this project activity is a micro gasifier cookstove using the Top-Lit Up-Draft (TLUD) technology. The TLUD is distributed to households using fuelwood for cooking. In the Top-Lit Up-Draft (TLUD) technology dry biomass fuel is ignited on the top of a vertical container, starting the process of pyrolysis. While a pyrolysis front moves downwards, the produced wood gas moves upward and as it exits the stove it is combusted in a flame appropriate for cooking. The TLUD allows for significant savings of firewood compared to traditional stoves and additionally generates charcoal. Its design ensures efficient combustion of fuel and cleaner fire; it therefore uses considerably less fuel as compared to traditional stoves. This means speedy cooking, time and fuel savings, cleaner pans, kitchen walls and indoor atmosphere. Charcoal is not combusted in the TLUD stove, it can therefore be collected and used for other purposes.

Types and levels of services

The TLUD allows for significant savings of firewood compared to traditional stoves and additional generates charcoal. The TLUD is especially suitable for the cooking habits of the people in the target region, since rice is the basic dish. Its design ensures efficient combustion of fuel and cleaner fire and therefore uses considerably less fuel as compare to traditional stoves. This means speedy cooking, time and fuel savings, cleaner pans, kitchen walls and indoor atmosphere.

Charcoal generated in the TLUD is collected from TLUD users and sold to users of conventional charcoal such as local retailers. No charcoal is sold to large-scale industries.

The age and average lifetime

The lifetime of the stove is 7 years

The existing efficiencies

The TLUD ICS has a thermal efficiency of over 20%. The TLUDs efficiency was tested and confirmed according to water boiling tests carried out by the MSME (Ministry of Micro-, Small- and Medium Enterprises). In these tests the TLUDs efficiency was calculated without accounting for charcoal generation, due to the planned re-use of charcoal produced by the TLUD. The thermal efficiency was tested as 28%.

Energy and mass flows

In the project scenario, the flow of conventional woody biomass into households for cooking is reduced by the use of TLUDs that use biomass more efficiently. Moreover, the flow of conventional biomass into traditional kilns is reduced, since the consumers of conventional charcoal replace a part of this conventional charcoal by charcoal generated in the TLUDs.

Energy flows from conventional woody biomass to households are therefore maintained, but the same amount of energy as used in the baseline scenario is gained from a relatively smaller amount of biomass. Energy flows from conventional woody biomass into conventional charcoal are reduced by partly replacing the latter with charcoal generated in TLUDs in the facilities of charcoal users. A new energy flow is created from conventional woody biomass over TLUDs into charcoal used by consumers of conventional charcoal.

Short summary of facilities, systems and equipment in the baseline scenario

In the baseline scenario, there is a pool of conventional woody biomass that is mostly non-renewable. It is burned by households for cooking in traditional cook stoves and it is used in traditional kilns to produce conventional charcoal; the latter being combusted in households and SMEs such as barbecue restaurants, manufacturers of incense sticks or tobacco driers and others.

The baseline scenario is equal to the current practice.

Timeline:

Date	Milestone
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07/06/2018	Start Date of the PoA (first notification of prior consideration Form to UNFCCC)
03/09/2018	Start of Design Consultation for the PoA
12/08/2018	Local Stakeholder Consultation for VPA 1
21/09/2018	Start of Stakeholder Feedback round for VPA 1
10/09/2018	Start of sales of stoves for VPA 1, stating with stove ID A70501
04/02/2020	First submission of the PoA for Preliminary review
03/04/2020	First submission of the VPA1 for Preliminary review
30/03/2021	GS registration of the PoA and VPA1
26/06/2020 – 31/08/2020	First Monitoring Period
01/09/2020 – 31/12/2020	Second Monitoring Period

A.2. Location of project

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The coordinates of the center of the project activity in Berachampa (local office of Sapient) are used to represent the physical location of the project activity:

- Latitude: 22° 41' 45.4236" N
- Longitude: 88° 41' 18.78"E



Figure 2: West Bengal as location of the VPA, corresponding to the red part.

A.3. Reference of applied methodology

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The activity applies two small scale baseline and monitoring methodologies:

- AMS-II.G, version 12 : "Energy Efficiency Measures in Thermal Applications of Non-Renewable Biomass". This methodology will be applied in any case.
- AMS-III.BG version 03 : "Emission reduction through sustainable charcoal production and consumption". ER will be claimed under this methodology in activities where charcoal generated in ICS will replace conventional charcoal.

Where the version number is not indicated in this VPA-DD, it is referred to the versions mentioned above

A.4. Crediting period of project

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Start date of crediting period

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The crediting period starts at the date of CDM inclusion of the CPA in the PoA (26/06/2020).

Total length of crediting period

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7 years, with the option of two more crediting periods.

26/06/2020 – 25/06/2027

SECTION B. IMPLEMENTATION OF PROJECT

B.1. Description of implemented project

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a) Policy/measure or stated goal that the CPA seeks to promote

The CPA aims at reducing the fuel wood consumption of traditional stove users by disseminating improved cook stoves, mainly micro wood gasifier stoves, at subsidized prices. Moreover, the consumption of conventional charcoal by traditional charcoal users shall be reduced by providing them charcoal generated in micro wood gasifier stoves.

(b) Framework for the implementation of the proposed PoA

To date partners are atmosfair gGmbH, also Project Participant, who provides funding and assist with CDM and GS matters, and Sapient Infotech, who manufacture stoves and distributes them at the local level. Other partners like stove manufacturers, stove distributors, charcoal managers etc. may be included.

The CPA facilitates the procurement of ICSs so that the end user can obtain them at subsidized prices. Carbon revenues are used to fund ICS distribution and to cover monitoring costs. Moreover, the CPA facilitates the collection of charcoal generated in ICSs from selected users and the sale of this charcoal to users who would otherwise have used conventional charcoal.

Number of stoves distributed:

MP1: 55,291

MP2: 82,589

No changes from the project design that was envisaged at Design Certified PDD have occurred during the covered Monitoring Periods.

B.1.1 Forward Action Requests

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One FAR has been raised during Design Certification:

PP shall include a question during the monitoring surveys to identify whether the end users are using LPG. VVB shall check the information during performance review and provide opinion on the same (FAR raised by GS).

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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No temporary deviations from the approved Monitoring & Reporting Plan, methodology or standardized baseline occurred during the covered MPs.

B.2.2. Corrections

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No corrections occurred during the covered MPs.

B.2.3. Changes to start date of crediting period

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No changes of the start date of crediting period occurred during the covered MPs.

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

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No permanent changes from the Design Certified monitoring plan, applied methodology or applied standardized baseline occurred during the covered MPs.

B.2.5. Changes to project design of approved project

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No changes to project design of approved project occurred during the covered MPs.

SECTION C. DESCRIPTION OF MONITORING SYSTEM APPLIED BY THE PROJECT

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There is a continuous documentation of all ICS distributions and charcoal collection in a centralized database. For the preparation of monitoring reports, samples were drawn from the centralized database and the corresponding stoves were examined regarding the relevant parameters. Charcoal generation was monitored through invoices/receipts from charcoal sales.

Each ICS will be given a unique ID. This ID consists in a letter and a number of at least four digits. E.g. A86597

The CME and/or PP holds the responsibility for all procedures related to monitoring, but cooperates with regional or local institutions involved in ICS distribution.

Central stove database

A central stove database is operated and maintained by the PP to ensure completeness and accuracy of monitoring information. The basic information for ICSs distributed to households are:

- Unique number (Stove-ID) of system
- Commissioning date of appliance (at the user's place)
- User details (name, address, phone number)
- Distributor

The information in these databases are updated continuously, whenever new data (distribution contracts) are available. Original copies of the distribution contracts will be kept and maintained for two years after the end of the crediting period.

As for charcoal sales, there is a database on charcoal sales, based on invoices/receipts of sales to charcoal buyers.

Stove IDs

Each ICS will obtain a unique number which facilitates its identification in the data base and avoid double counting. These unique numbers are provided by the PP and are inserted in the distribution contract at the moment of distributing the stove.

The unique numbers are made visible on the ICSs by blowtorching numbers on the stove material.

Direct Monitoring

The following parameters were monitored directly thus no sampling is necessary: $N_{o,i,j}$ and $Q_{CCP,i,y}$.

Sampling campaigns

Sampling campaigns consist in generating extracts of the central database for checks in order to prepare the monitoring reports. A representative number of ICS was selected randomly for each MP for site visits in order to check the following monitoring parameters:

Proportional parameters:

- $n_{y,i,j}$

Mean parameters:

- $new_{i,j}$
- $load_y$
- $fillings_y$

Different sample sizes can be selected for each of these parameters.

SECTION D. DATA AND PARAMETERS

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

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SDG13

Data/parameter	NCV_{wood} or $NCV_{biomass}$
Unit	TJ/tonne
Description	Net calorific value of the non-renewable woody biomass that is substituted
Source of data	AMS-II.G, version 12, default value

Value(s) applied	0.0156
Choice of data or Measurement methods and procedures	This is the IPCC default value for wood fuel as provided by AMS II.G version 12, para. 24.
Purpose of data	Calculation of baseline emissions
Additional comment	-

Data/parameter	<i>NCV_{charcoal,default}</i>
Unit	GJ/tonne
Description	Default net calorific value of charcoal
Source of data	AMS-III.B
Value(s) applied	29.5
Choice of data or Measurement methods and procedures	Default value according to AMS-III.BG, appendix 1 option 1, from IPCC 2006, Volume 2, Table 1.2
Purpose of data	Calculation of baseline emissions
Additional comment	-

Data/parameter	<i>f_{NRB,y}</i>
Unit	%
Description	Fraction of woody biomass saved by the project activity in period y that can be established as non-renewable biomass
Source of data	Calculated
Value(s) applied	87.18% (value for West Bengal)

Choice of data or Measurement methods and procedures	See B.6.1 Determination of the Share of Non-Renewable Biomass
Purpose of data	Calculation of baseline emissions
Additional comment	

Data/parameter	$EF_{projected_fossilfuel}$
Unit	tCO ₂ /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 12, default value under para. 24.
Value(s) applied	63.7
Choice of data or Measurement methods and procedures	The applied values is used to be in line with the CDM CPA DD (Default value as provided by AMS II.G version 10, par.17).
Purpose of data	Calculation of baseline emissions
Additional comment	-

Data/parameter	L_y
Unit	Fraction
Description	Leakage adjustment factor period y
Source of data	Default value
Value(s) applied	0.95
Choice of data or Measurement methods and procedures	According to AMS-II.G, version 12, para 41, $B_{y,i,j,savings}$ can be multiplied by a net to gross adjustment factor 0.95 to account for leakage in which case surveys are not required.

Purpose of data	Calculation of baseline emissions
Additional comment	-

Data/parameter	CF
Unit	-
Description	Conversion factor fuelwood to conventional charcoal
Source of data	AMS-III.BG, version 3
Value(s) applied	6
Choice of data or Measurement methods and procedures	Default value given in AMS-III.BG, version 3
Purpose of data	Calculation of baseline emissions
Additional comment	-

Data/parameter	GWP_{CH4}
Unit	t CO ₂ e/t CH ₄
Description	Global warming potential of methane
Source of data	www.ipcc.ch/publications_and_data/ar4/wg1/en/ch2s2-10-2.html#table-2-14
Value(s) applied	25
Choice of data or Measurement methods and procedures	IPCC default value www.ipcc.ch/publications_and_data/ar4/wg1/en/ch2s2-10-2.html#table-2-14
Purpose of data	Calculation of baseline emissions
Additional comment	-

Data/parameter	SMG_{y,b}
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Unit	t CH ₄ /t
Description	Specific methane generation for the baseline charcoal generation process in the year y
Source of data	AMS-III.BG, version 3.
Value(s) applied	0.030
Choice of data or Measurement methods and procedures	Default value given in AMS-III.BG, version 3.
Purpose of data	Calculation of baseline emissions
Additional comment	-

Data/parameter	<i>Md</i>
Unit	t CH ₄ /t
Description	Factor to account for any legal requirement for capture and destruction of methane in the charcoal production facility
Source of data	AMS-III.BG, version 03.
Value(s) applied	0
Choice of data or Measurement methods and procedures	There is obviously no requirement on capture and destruction of methane in micro gasifier stoves
Purpose of data	Calculation of baseline emissions
Additional comment	-

D.2 Data and parameters monitored

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SDG 13

Data / Parameter	<i>B_{y=1,new,survey}</i>
Unit	t/year

Description	Quantity of woody biomass used by project devices in tonnes per project device
Source of data	Survey on fillings _{y=1} and load _{y=1} as described below.
Value(s) applied	MP1: 1.74 MP2: 1.64
Measurement methods and procedures	A representative sample of randomly selected users was asked for the average number of weekly loads of fuelwood burnt in their ICS, specifying loads per specific meal and days of usage per week. The average weight of a ICS fuelwood load was determined as the average value obtained over all WBTs that are conducted to determine $n_{new,j}$. $B_{y=1,new,survey}$ was calculated as follows: $B_{y=1,new,survey} = \text{fillings}_{y=1} * \text{load}_{y=1} * 0.052$ (conversion factor to from kg /week to t/a fillings_{y=1} : Average number of weekly fillings of a batch-loaded ICS load_{y=1}, : Average amount of fuelwood used per filling of an ICS. Preliminary values are from a survey done during the last monitoring of the GS 1296 project (MP6).https://impact.sustain-cert.com/public_projects/181: fillings_{y=1}: MP1: 31.27 MP2: 29.63 load_{y=1}, : MP1: 1,068 kg MP2: 1,066 kg
Monitoring frequency	Annually
QA/QC procedures	-
Purpose of data	Calculation of baseline emissions
Additional comment	-

Data / Parameter	η_{old}
Unit	%
Description	Efficiency of the baseline system being replaced
Source of data	AMS-II.G, version 12, default value
Value(s) applied	0.10
Measurement methods and procedures	According to AMS II.G, ver. 12, Table 24, a default value of 0.10 can be used, if the “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”. Traditional stoves in India meet these conditions.
Monitoring frequency	Fixed for each individual household when included in the project activity database
QA/QC procedures	-
Purpose of data	Calculation of baseline emissions
Additional comment	-

Data / Parameter	$\eta_{new,j}$
Unit	%
Description	Efficiency of the device of each type i and batch j implemented as part of the project activity calculated without accounting for the remaining charcoal
Source of data	Primary data collection during monitoring campaigns by dedicated monitoring team based on WBT. The efficiency of the project devices was confirmed by the testing center of the Ministry of Micro, Small & Medium Enterprises.
Value(s) applied	MP1: 27.78% MP2: 27.13%
Measurement methods and procedures	Adjustment of $\eta_{new,i,j}$ due to efficiency loss will be monitored according to AMS-II.G version 10 para 32.

	No batches were established for ER calculation. Thus the stove efficiency is determined from a representative random subsample of all stoves included in the monitoring period. The efficiency of the project devices will be monitored annually following the Water Boiling Test (WBT) protocol version 4.2.3, performed by a dedicated monitoring team. The WBT results were evaluated without accounting for remaining charcoal, according to AMS-III.BG.																				
Monitoring frequency	Annually																				
QA/QC procedures	It will be assured that all requirements of the sampling plan of the CPA are met. Data were collected using the standard procedures and will be stored for the crediting period and an additional two years. Only calibrated equipment was used, according to requirements in the project standard.																				
Purpose of data	Calculation of baseline emissions																				
Additional comment	Specifications of equipment: <table border="1"> <tr> <td></td><td><u>Precision Balance</u></td></tr> <tr> <td>Type/Name</td><td>ST III</td></tr> <tr> <td>Accuracy class</td><td>+/- 0.5 g</td></tr> <tr> <td>Serial number</td><td>3330</td></tr> <tr> <td>Calibration date</td><td>MP1: 05/02/2020 MP2: 21/01/2021</td></tr> </table> <table border="1"> <tr> <td></td><td><u>Thermometer</u></td></tr> <tr> <td>Type/Name</td><td>Digital Thermometer Elanco</td></tr> <tr> <td>Accuracy class</td><td>0.01°C, Temperature range -50° C - +200° C</td></tr> <tr> <td>Serial number</td><td>T18978</td></tr> <tr> <td>Calibration date</td><td>MP1: 30/01/2020 MP2: 11/12/2020</td></tr> </table>		<u>Precision Balance</u>	Type/Name	ST III	Accuracy class	+/- 0.5 g	Serial number	3330	Calibration date	MP1: 05/02/2020 MP2: 21/01/2021		<u>Thermometer</u>	Type/Name	Digital Thermometer Elanco	Accuracy class	0.01°C, Temperature range -50° C - +200° C	Serial number	T18978	Calibration date	MP1: 30/01/2020 MP2: 11/12/2020
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SDG 13 and SDG 7

Data / Parameter	$N_{o,i,j}$
Unit	Number
Description	Number of commissioned project devices of type i and batch j
Source of data	Primary data source are copies of ICS sales contracts signed by stove users, including the date of sale. These are the basis for the Sales Record Database, including all ICS users.
Value(s) applied	MP1: 9,671 MP2: 23,405
Measurement methods and procedures	The measurement of the parameter will be based on the number of sales contracts stored and the corresponding number of entries of ICS sold in the database. For ICS that have been sold within the relevant monitoring period, only the number of days between the sales date (date of commissioning of the project device) and the end of the monitoring period will be considered. Therefore, $N_{o,i,j}$ will include an adjustment factor by applying the following formula: $N_{o,i,j} = N_{soldtotal_{y,j}} * d_{average_y} / m_{length_y}$ Where: $N_{soldtotal_{y,j}}$ total number of ICS sold within monitoring period y $d_{average_y}$ average number of days ICS sold in period y were operational in period y, derived from sales dates on sales contracts m_{length_y} length of period y For SDG 7 Target 7.1. the overall number of sold ICS are relevant and will be tracked in the sales record base.
Monitoring frequency	The database will be updated according to the frequency of ICS sales, at least annually.

QA/QC procedures	Data and contracts will be collected using the standard procedures and will be kept for two years after the end of the crediting period or the last issuance of carbon credits for this project activity, whichever occurs later.
Purpose of data	Calculation of baseline emissions
Additional comment	

Data / Parameter	$n_{y,i,j}$
Unit	Fraction
Description	Proportion of commissioned project devices of type i and batch j ($NO_{i,j}$) that remain operating in year y (fraction)
Source of data	Monitored
Value(s) applied	MP1: 1 MP2: 1
Measurement methods and procedures	$n_{y,i,j} = 1 - \text{drop out rate}$ The Drop-outs will be determined by sampling through interviews where it will be checked if the appliances are still operational, performed by a dedicated monitoring team. Interviews will be reported in a questionnaire.
Monitoring frequency	The CME and/or PP may decide to do annual or biennial inspections.
QA/QC procedures	Data will be collected using the standard procedures and will be kept for two years after the end of the crediting period or the last issuance of carbon credits for this project activity, whichever occurs later.
Purpose of data	Calculation of baseline emissions
Additional comment	-

Data / Parameter	$QCCP_{i,y}$
Unit	Tonnes
Description	Produced quantity of charcoal product i in year y

Source of data	Measurement from project activity production and delivery to eligible charcoal buyers								
Value(s) applied	MP1: 0.33 MP2: 0.33								
Measurement methods and procedures	The parameter was according to the following options: Option1: Direct measurement (e.g. use of a scale) of the weight of charcoal products supplied; at the site of the charcoal users or retailers $Q_{CCP,i,y}$ was derived from invoices/receipts of sales of charcoal generated in the VPA to charcoal users and retailers. If feasible, the weight of charcoal delivered will be indicated on invoices, requiring the availability of calibrated weighbridges or other scales. Simultaneously, it will be checked that charcoal buyers are eligible according to para. 4 of AMS-III.BG version 03.								
Monitoring frequency	In sets, depending on the deliveries to charcoal buyers or retailers								
QA/QC procedures	The entire chain of charcoal collection will be documented, demonstrating how the amount of charcoal delivered to users of conventional charcoal relates to the amount generated by users. There will be cross checks with: - total quantity of charcoal generated by the micro gasifiers based on monitored fuelwood consumption and the observed conversion-rate to charcoal. - the average amounts of charcoal collected from stove users based on records of field assistant collecting charcoal								
Purpose of data	Calculation of baseline emissions								
Additional comment	Specifications of scales used: <table border="1"> <tr> <td></td><td>Balance Deganga</td></tr> <tr> <td>Type/Name</td><td>AMI</td></tr> <tr> <td>Serial number</td><td>60750201</td></tr> <tr> <td>Accuracy Class</td><td>Class III</td></tr> </table>		Balance Deganga	Type/Name	AMI	Serial number	60750201	Accuracy Class	Class III
	Balance Deganga								
Type/Name	AMI								
Serial number	60750201								
Accuracy Class	Class III								

	Calibration date	MP1:05/02/2020 MP2: 21/01/2021
		<u>Balance Uluberia</u>
	Type/Name	B.M. Group, Model BMP III
	Serial number	1625
	Accuracy Class	Class III
	Calibration date	MP1: 24/02/2020 MP2: 21/01/2021
		<u>Purba Medinipur Balance</u>
	Type/Name	Silver Eagle, MMH-PF
	Serial number	E 16429
	Accuracy Class	Class III
	Calibration date	MP1: 03/07/2020 MP2: 03/07/2020

Data / Parameter	NCV_{charcoal}
Unit	GJ/ton
Description	Net calorific value of charcoal type i generated in ICSs in the project activity
Source of data	Results of charcoal analysis by an accredited laboratory.
Value(s) applied	MP1: 29.05 MP2: 28.58
Measurement methods and procedures	According to Option 1 in the PDD: monitored once during the first year of the crediting period. Measurement is undertaken in laboratories according to relevant national/international standards. Measure quarterly, taking at least three samples for each measurement. The average value can be used for the rest of the crediting period provided that there is no change in the biomass types used for charcoal i production.
Monitoring frequency	Monitored once during the first year of the crediting period.
QA/QC procedures	-

Purpose of data	Calculation of baseline emissions
Additional comment	-

Data / Parameter	<i>Life Span</i>
Unit	Number of years
Description	The operating life time of the project device. The life span should be reported in cases where the PPs are opting to account the efficiency loss as per paragraph 32
Source of data	Manufacturer (certified by a national standards body or an appropriate certifying agent recognized by that body)
Value(s) applied	7 years
Measurement methods and procedures	-
Monitoring frequency	Fixed and recorded at the time of commissioning
QA/QC procedures	-
Purpose of data	-
Additional comment	-

Data / Parameter	<i>Date of commissioning of batch j</i>
Unit	Date
Description	To establish the date of commissioning, the Project Participant may opt to group the devices in "batches" and the latest date of commissioning of a device within the batch shall be used as the date of commissioning for the entire batch
Source of data	Stove data base (Internal records)
Value(s) applied	No batches are established
Measurement methods and procedures	The stove sales are tracked in a database.

Monitoring frequency	Fixed and recorded at the time of commissioning/distribution of the last project device in the batch
QA/QC procedures	Data will be tracked in a stove database and will be stored for the crediting period and an additional two years.
Purpose of data	Calculation of emission reduction
Additional comment	The batches established for the determination of the commissioning date are not the same as the age classes used for efficiency testing.

Data / Parameter	<i>Date of commissioning of project device i</i>
Unit	Date
Description	Actual date of commissioning of the project device
Source of data	Stove data base (Internal records)
Value(s) applied	Several dates starting from 10/09/2018
Measurement methods and procedures	The stove sales are tracked in a database.
Monitoring frequency	Fixed and recorded at the time of commissioning/distribution
QA/QC procedures	Data will be tracked in a stove database and will be stored for the crediting period and an additional two years.
Purpose of data	Calculation of emission reduction
Additional comment	-

Data / Parameter	<i>N_{d,HH}</i>
Unit	Number
Description	Number of project devices distributed per household
Source of data	Stove data base (Internal records)
Value(s) applied	MP1: 1

	MP2: 1
Measurement methods and procedures	The stove users and their stoves are tracked in the stove data base (internal records).
Monitoring frequency	Fixed and recorded at the time of commissioning/distribution
QA/QC procedures	Data will be collected in the stove database and will be stored for the crediting period and an additional two years.
Purpose of data	Calculation of emission reduction
Additional comment	To be reported in the monitoring report

(SDG 1: No Poverty)

Data / Parameter	<i>Income generated by the sales of the charcoal</i>
Unit	INR or Euro per year
Description	Stove users can sell the charcoal generated in the stove during cooking to the project.
Source of data	Documentation of the quantities of charcoal purchased by field assistants for the project and the prices paid.
Value(s) applied	MP1: 25,571,560 INR MP2: 61,969,512 INR
Measurement methods and procedures	It will be monitored how many users benefit from selling charcoal and what is the average income they obtain from it. Monitoring will be based on the documentation of the charcoal collection chain set up by the project, including, among other, quantities of charcoal purchased by field assistants for the project, prices paid and receipts for sale to charcoal users. Also answers of users interviewed during monitoring will be used as evidence.
Monitoring frequency	annual
QA/QC procedures	The amount of charcoal collected can be crosschecked with the usage data of the stoves, which are monitored for ER calculation.

Purpose of data	Establish the income generated by the sales of the charcoal
Additional comment	-

(SDG 8: Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all)

Data / Parameter	<i>Number of jobs created by the project activity.</i>																				
Unit	#																				
Description	The project will employ Field Assistants for stove distribution and charcoal collection. Depending on the number of stoves distributed, additionally drivers will be employed to support charcoal collection. Most jobs will be full time or near to full time. The payment will be above normal local level.																				
Source of data	Documentation of staff employed by the project																				
Value(s) applied	<table><tr><td></td><td>MP1</td><td>MP2</td></tr><tr><td>Number of employed Field Assistants (charcoal FAs)</td><td>202</td><td>235</td></tr><tr><td>Number of Sales personal</td><td>32</td><td>32</td></tr><tr><td>Number of people employed in stove production - Factory workers</td><td>8</td><td>8</td></tr><tr><td>Number of jobs total</td><td>242</td><td>278</td></tr><tr><td>New jobs created in the MP</td><td>242</td><td>36</td></tr></table>				MP1	MP2	Number of employed Field Assistants (charcoal FAs)	202	235	Number of Sales personal	32	32	Number of people employed in stove production - Factory workers	8	8	Number of jobs total	242	278	New jobs created in the MP	242	36
	MP1	MP2																			
Number of employed Field Assistants (charcoal FAs)	202	235																			
Number of Sales personal	32	32																			
Number of people employed in stove production - Factory workers	8	8																			
Number of jobs total	242	278																			
New jobs created in the MP	242	36																			
Measurement methods and procedures	The number of types of jobs created by the project activity will be monitored, distinguishing, among others, between stove distribution, charcoal collection and drivers. Also, the level of wages and the equality of payment for both men and women for the same job will be monitored.																				
Monitoring frequency	annual																				
QA/QC procedures																					
Purpose of data	Establish the number of jobs created by the project activity																				

Additional comment

Number of jobs created by the project activity.

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

Data / Parameter	Value obtained in this monitoring period	Value obtained last monitoring period
$B_{y=1,new,survey}$	1.64	1.74
$load_y$	1,066	1,068
$fillings_y$	29.63	31.27
$\eta_{new,j}$	27.13%	27.78%
$n_{y,i,j}$	1	1
$N_{o,i,j}$	23,405	9,671
$QCCP_{i,y}$	0.33	0.33
$NCV_{charcoal}$	28.58	29.05
$N_{d,HH}$	1	1
Income generated by the sales of the charcoal	61,969,512	25,571,560
Number of jobs created by the project activity	242	278

D.4. Implementation of sampling plan

>>

a) Description of implemented sampling design

Due to the high number of ICS to be deployed an annual check of all appliances is not feasible. Sampling methods were applied to determine the values for $n_{y,i,j}$, $\eta_{new,i,j}$, and parameters to determine $B_{y=1,new,survey}$ ($load_y$ and $fillings_y$).

We used a simple random sampling process. Random samples are drawn from the central stove database via a computerized randomizer.

$N_{o,i,j}$ was monitored through sales/distribution records for all appliances deployed till the end of the Monitoring period, whereas the other parameters were determined through a sampling campaign.

$Q_{CCP,y}$ was monitored using Option1 described in the CPA DD: $Q_{CCP,y}$ was derived from invoices/receipts of sales of charcoal generated in the CPA to charcoal users and retailers. The weight of charcoal delivered was indicated on invoices.

b) Sampling requirements as per sampling standard and applicable methodology
Coverage of sampling requirements in the applicable methodology:

As per applicable methodology AMS-II.G ver. 12. par. 48, "When biennial inspection is chosen a 95 per cent confidence interval and a 10 per cent margin of error shall be achieved for the sampling parameter. On the other hand, when the project proponent chooses to inspect annually, a 90 per cent confidence interval and a 10 per cent margin of error shall be achieved for the sampled parameters. In cases where survey results indicate that 90/10 precision or 95/10 precision are not achieved, the lower bound of the 90 per cent or 95 per cent confidence interval of the parameter value may be chosen as an alternative to repeating the survey efforts to achieve the 90/10 or 95/10 precision. In cases where survey results indicate that 90/10 precision or 95/10 precision are not achieved, the lower bound of the 90 per cent or 95 per cent confidence interval of the parameter value may be chosen as an alternative to repeating the survey efforts to achieve the 90/10 or 95/10 precision.

Additional requirement for PoAs as per sampling standard vers 8.0:

Para 22: In case a single sampling plan for more than one CPA is used, "parameter values shall be estimated by sampling in accordance with the requirements in the applied methodology separately and independently for each of the CPAs included in a PoA except when a single sampling plan covering a group of CPAs is undertaken applying 95/10 confidence/precision for the sample size calculation", as per EB 50 Annex 30 STAN, version 07.0.

Para 23: In the case of CPAs solely composed of "microscale CDM units" as defined in the Methodological tool "Demonstration of additionality of microscale project activities", 95/10 confidence/precision shall be applied for sampling surveys in all cases, even when they are conducted at the CPA level.

Since the CPA consists only of CDM microscale Units, 95/10 confidence and precision was applied.

c) Target Population

For the monitoring parameters $n_{y,i,j}$, $\eta_{new,i,j}$, $load_y$ and $fillings_y$ the target population consists in all ICS which are included until the end of the specific monitoring period. For the monitoring parameter $weightbags_{y,i}$, where applicable in order to determine $QCCP_{i,y}$, the target population consists in all charcoal bags for which the average weight shall be determined.

Sampling for CPA 1 MP1 and MP2:

As described in the CPA DD, a central stove database was established, including data on all TLUD stoves sold since the start date of the project, including information on:

- Stove ID (unique number of stove)
- Delivery date of appliance (to user)
- Field assistant who sold the stove
- User details (Name, Address, phone number if available etc.)

Number of stoves included in the database:

MP1: 55,291 stoves

MP2: 82,589 stoves

d) Sampling method

Simple random sampling was applied.

The largest number for the sample size was chosen for the sampling effort with one common survey for $n_{y,i,j}$ and $fillings_y$. For the monitoring of $\eta_{new,i,j}$ and $load_y$, a random sub-sample from the common sample was drawn according to the calculated sample size of the parameter.

The users were randomly selected via a computerized randomizer from the sales record databases containing the full ICS population for the respective Monitoring Period. Simple random sampling was applied for all stove related parameters.

Random distribution

All random selections will be stored for two years after the end of the crediting period or the last issuance of CERs for this project activity, whichever occurs later. In this way the traceability of the selection is assured.

e) Sample size

For $n_{y,i,j}$ sample sizes of 21 (MP1) and 0 (MP2) were calculated, for fillings_y the calculated sample sizes were 12 (MP1) and 8 (MP2). According to the sampling standard and the CPA DD the minimum sample size for percentage parameters is 30. Taking into account possible non response rate of 85%, we increased the size of the monitoring list for the common survey of $n_{y,i,j}$ and fillings_y to 36.

For $\eta_{new,i,j}$, the calculated sample sizes were 7 (MP1) and 2 (MP2), for the parameter load_y=1 the were 7 (MP1) and 2 (MP2). We chose a larger sample size of 9 samples for the common sample applying oversampling.

Summary of estimated and applied sample sizes:

Parameter	Timeframe, CPA frame	Confidence/Precision	Estimated value	Standard deviation	Estimated Sample Size	Applied sample size
$n_{y,i,j}$	Microscale units	95/10	MP1: 0.95 MP2: 1.0	MP1: n.a MP2: n.a	MP1: 21 MP2: 0	MP1: 30 MP2: 30
$\eta_{new,i,j}$			MP1: 0.28 MP2: 0.28	MP1: 0.03 MP2: 0.002	MP1: 7 MP2: 2	MP1: 9 MP2: 9
fillings _y			MP1: 29.89 MP2: 31.27	MP1: 4.48 MP2: 3.55	MP1: 12 MP2: 8	MP1: 20 MP2: 30
load _y			MP1: 1,087 MP2: 1,068	MP1: 108.7 MP2: 6.98	MP1: 7 MP2: 2	MP1: 9 MP2: 9

The list of samples for the common sample for $n_{y,i,j}$ and fillings_y included 36 households. 30 of them were interviewed during the time of the interview period. This is the minimum sample size requested in the sampling standard and the CPA DD and more than required from the sample size calculation. The response rate was 100%, since all contacted households could be interviewed. $n_{y,i,j}$ was 100%, meaning that all distributed stoves are in use.

The list of samples for the common sample for $\eta_{new,i,j}$ and load_y included 9 households. All 9 tests could be conducted, meaning the calculated minimum sample size was reached and the response rate was 100%.

SECTION E. CALCULATION OF SDG IMPACTS

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

>>

Goal 1: Target 1.1:

The parameter to measure this goal will be the income generated by the sales of the charcoal.

		MP1	MP2
Payment per kg charcoal	INR/kg	8.00	8.00
Collected charcoal per year	kg	330.52	330.96
Additional income per household	INR	2,644.15	2,647.70
Total	INR	25,571,560	61,969,512

Goal 7: Target 7.1:

The measurement of the parameter will be based on the number of sales contracts stored and the corresponding number of entries of ICS sold in the database.

	MP1	MP2
Stoves sold	55,291	82,589
Drop out	0%	0%
Number of HH using ICS	55,291	82,589

Goal 8: Target 8.5:

The parameter to monitor the target is the number of jobs created by the project activity.

	MP1	MP2
Number of employed Field Assistants (charcoal FAs)	202	235
Number of Sales personal	24	24
Number of people employed in stove production - Factory workers	8	8
Number of jobs total	242	278
New jobs created in the MP	242	36

Goal 13: Target 13.2:

Emission reductions are calculated by summarizing ER from two components

(see equation 1)

$$ER_{total} = ER_{II.G} + ER_{III.BG}$$

According to equation 5, emission reductions for the energy efficiency component are calculated as:

(equation 5)

$$ER_{II.G,y} = \sum_i \sum_j B_{y=1,new,i,survey} \times \left(\frac{\eta_{new,i,j}}{\eta_{old,i,j}} - 1 \right) \times 0.95 \times N_{o,i,j} \times n_{y,i,j} \times \mu_{y,i,j} \times f_{NRB,y} \times NCV_{biomass} \times EF_{projected_fossil\ fuel}$$

The only parameters that are not determined ex-ante are $\eta_{new,j}$, $n_{y,i,j}$, and $N_{o,i,j}$, which are monitored or calculated from monitored parameters.

A drop-out rate of 5% is assumed for preliminary calculations based on the results of a survey done during the last monitoring of the GS 1296 project (MP6; 0% drop out) and as conservative assumption.

Emission reductions from the charcoal replacement component are calculated using **equation 9**.

$$ER_{III.BG,y} = \sum_i Q_{CCP_y} \times \left[\left(CF \times NCV_{wood} \times \frac{NCV_{charcoal}}{NCV_{charcoal,default}} \times f_{NRB,BL,wood} \times EF_{projected_fossilfuel} \right) + SMG_{y,b} \times (0.9 - f_{NRB,BL,wood}) \times GWP_{CH4,y} \right]$$

$Q_{CCPi,y}$ will be monitored. All other parameters are fixed ex-ante.

For increased clarity, the calculation of emission reductions per distributed stove and year is summarized in the following tables (example):

Parameter ID	Description	Derived as	Unit	MP1 Value	MP2 Value
A	$B_{y=1, new, survey}$	Monitored	tons/a	1.74	1.64
B	$\eta_{new, j}$ (efficiency of the project device batch j implemented as part of the project activity from a WBT without considering remaining charcoal)	Monitored	%	27.78%	27.13%
C	η_{old} (efficiency of replaced stove)	AMS-II.G default	%	10.00%	10.00%
D	L_y : Discount for leakage	AMS-II.G		95.00%	95.00%
E	$B_{savings}$ per stove	$A * ((B/C) - 1) * D$	tons/a	2.93	2.67
F	$N_{0, i, j}$	Monitored		9,671	23,405
G	$n_{y, i, j}$	Monitored	%	1.00	1.00
H	f_{NRB} : fraction of non-renewable biomass	NRB/(NRB+DRB), for West Bengal	%	87.18%	87.18%
I	$EF_{projected_fossilfuel}$	AMS-II.G default	tCO ₂ /TJ	63.70	63.70
J	$NCV_{biomass \text{ or wood}}$	AMS-II.G default	TJ/t	0.0156	0.0156
ER _{II.G} per ICS		$E * F * G * H * I * J$	tons	24,572.46	54,200.79
K	$Q_{CCP, i, y}$: Quantity of charcoal produced and used	Monitored	tons	0.33	0.33
L	CF : Conversion factor wood to charcoal	AMS-II.G defaults, IPCC guidelines		6.00	6.00
M	$NCV_{charcoal} / NCV_{charcoal, default}$	Default value for NCVcharcoal according to AMS-III.BG		0.98	0.97
N	$SMG_{y, b}$	Default given in AMS-III.BG.		0.03	0.03
O	GWP_{CH4}	Default IPCC value		25.00	25.00
ER _{III.BG} per ICS for use of charcoal replacing charcoal		$K * ((L * J * M * H * I) + (N * (0.9 - H) * O))$	tCO ₂	16,431.56	39,177.53
Possible total ER per ICS			tCO ₂ /a	41,004.00	93,378.00

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

>>

Not applicable.

E.3. Calculation of leakage

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According to AMS-II.G the default net to gross adjustment factor of 0.95 is applied to account for leakage and therefore surveys are not required.

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

SDG	SDG Impact	Baseline estimate	Project estimate	Net benefit
1	Income for the households generated by the sales of the charcoal in INR.	0	MP1: 25,571,560 MP2: 61,969,512	MP1: 25,571,560 MP2: 61,969,512
7	Number of households using clean cooking devices such as Improved Cook Stoves.	0	MP1: 55,291 MP2: 82,589	MP1: 55,291 MP2: 82,589
8	The number of jobs created by the project activity.	0	MP1: 242 MP2: 278	MP1: 242 MP2: 278
13	Emission Reductions	0	MP1: 41,004 MP2: 93,378	MP1: 41,004 MP2: 93,378

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 ¹ achieved during this monitoring period
1	MP1: 14,801,307 MP2: 26,951,634	MP1: 25,571,560 MP2: 61,969,512
7	MP1: 75,974 MP2: 85,500	MP1: 55,291 MP2: 82,589
8	MP1: 220 MP2: 251	MP1: 242 MP2: 278
13	MP1: 55,884 MP2: 101,758	MP1: 41,004 MP2: 93,378

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

>>

¹ Whenever emission reductions are capped, both the original and capped values used for calculations must be transparently reported. Use brackets to denote original values.

SDG1: Income for the households generated by the sales of the charcoal in INR

Ex-ante estimate for the MPs:

	MP length (days)	Ex-ante estimate of income created (INR)
2020	365	81,120,000
MP1	67	14,890,521
MP2	122	27,114,082

Calculation: Income expected in full year/365*length of MP

SDG 7: Number of households using clean cooking devices such as Improved Cook Stoves.

Ex-ante estimate for the MPs:

	$N_{o,i,j} * n_{y,i,j}$	New stoves commissioned in the year
2018	15,000	30,000
2019	43,500	30,000
2020	71,325	30,000

*5% Drop out

	No stoves
MP1	75,974
MP2	85,500

Calculation MP1:

Stoves operation in MP1= (Stoves distributed in 2018 + stoves distributed in 2019 + stoves distributed from 01.1.2020 till the end of MP1) * (1-5% drop out)

Stoves operation at the end of MP1= 30,000 + 30,000 + (30,000 / 365* (31+28+31+30+31+30+31+31) * 0.95 = 75,974

Calculation MP2: Stoves operation in MP1= Stoves distributed in 2018 + stoves distributed in 2019 + stoves distributed in 2020* (1-5% drop out)

Stoves in Operation at the end of MP2: $(30,000 + 30,000 + 30,000) * (1-5\% \text{ drop out}) = 85,500$

SDG 8: The number of jobs created by the project activity

Not applicable, since the created do not depend on the length of the monitoring periods.

SDG 13: Emission Reductions

Ex-ante estimate for the MPs:

	length (days)	ER
2020	365	304,441
MP1	67	55,884
MP2	122	101,758

Calculation: ER expected in full year/365*length of MP

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

>>

SDG 1 and SDG 8 have higher values achieved, than expected ex-ante.

Explanation SDG 1: The ex-ante estimate was calculated on a base of 30,000 households included in the project, while in MP1 55,291 were included and in MP2: 82,589.

Explanation SDG 8: The project employed more people than expected:

MP1: 242 instead of 220

MP2: 278 instead of 251

Particularly more Field Agents were employed for the collection of charcoal than expected.

SECTION F. SAFEGUARDS REPORTING

>>

No Safeguarding principles were added to the monitoring plan.

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 grievance has been received during the monitoring periods.

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

>>

No mitigation measures were added during the monitoring periods.

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

>>

No legal contest has arisen during the monitoring periods.

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