

TEMPLATE

KEY PROJECT INFORMATION & VPA DESIGN DOCUMENT (PDD)

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VERSION **v. 1.1**

RELATED SUPPORT

– TEMPLATE GUIDE Key Project Information & VPA Design Document v.1.1

This document contains the following Sections

Key Project Information

Section A – Description of project

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KEY PROJECT INFORMATION

GS ID of Project	PoA: GS 7776 VPA1: GS 10716
Title of Project	PoA: Improved cook stoves and sustainable charcoal initiative VPA1: Improved cook stoves and sustainable charcoal initiative, CPA 1
Time of First Submission Date	PoA: 04/02/2020 VPA 1: 03/04/2020
Date of Design Certification	05/03/2021
Version number of the VPA-DD	4
Completion date of version	02/02/2021
Coordinating/managing entity	Nature Club of Rajasthan
VPA Implementer (s)	atmosfair gGmbH
Project Participants and any communities involved	Nature Club of Rajasthan
Host Country (ies)	Republic of India
GS ID and Title of applicable Design Certified VPA	N/A
GS ID and Title of applicable Performance Certified VPA	N/A
Activity Requirements applied	☒ Community Services Activities ☐ Renewable Energy Activities ☐ Land Use and Forestry Activities/Risks & Capacities ☐ N/A
Scale of the project activity	☐ Micro scale ☒ Small Scale ☐ Large Scale
Other Requirements applied	-
Methodology (ies) applied and version number	AMS-II.G vers.12, AMS-III.BG. vers. 3
Product Requirements applied	☒ GHG Emissions Reduction & Sequestration ☐ Renewable Energy Label

	☐ N/A
Project Cycle:	☒ Regular
	☐ Retroactive

Table 1 – Estimated Sustainable Development Contributions

Sustainable Development Goals Targeted	SDG Impact (defined in Fehler! Verweisquelle konnte nicht gefunden werden.)	Estimated Annual Average	Units or Products
1 End poverty in all its forms everywhere	Income for the households generated by the sales of the charcoal in INR.	81,120,000	INR per year
7 Ensure access to affordable, reliable, sustainable and modern energy for all	Number of households using clean cooking devices such as Improved Cook Stoves.	30,000	Number per year
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.	31	Number per year
13 Climate Action	Emission Reductions	608,058	tCO _{2e} /year

SECTION A. DESCRIPTION OF PROJECT

A.1. Purpose and 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 to be implemented in this project activity is a micro gasifier cookstove using the the Top-Lit Up-Draft (TLUD) technology. The TLUD will be 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 will be collected from TLUD users and sold to users of conventional charcoal such as local retailers. No charcoal will be 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 (with f_{NRB} as indicated in B.4.1). 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
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, starting 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

A.1.1. Eligibility of the project under approved PoA

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No.	Eligibility Criterion	Description/ Required condition	Means of Verification/Supportin g evidence for inclusion
1	Geographical boundaries of V/CPAs consistent with the geographical boundary of the PoA;	The geographical boundary of the PoA is the Republic of India. The PoA and all CPAs will be implemented within the boundaries of the Republic of India.	Evidence for inclusion: CPA-DD, describing the location of the CPA in Section A.2.
2	Conditions to avoid double counting of Impacts, such as unique identifications of product and end user locations (e.g. programme logo);	A unique numbering system for ICS will be applied in each CPA, assigning a unique number to each ICS and allowing to clearly identify for each ICS to which CPA it belongs.	Evidence for inclusion: CPA-DD, describing the unique ICS numbering system for the CPA in Section B.7.2.
3	Conditions to confirm that V/CPAs are neither registered as project activities with other offset Schemes, included in other registered PoAs, nor the project activities	The CPAs are not registered under any other offset Scheme, except the GS and the CDM. No CPA will be registered as CDM Project activities, included in other PoAs nor be a deregistered project activity.	Evidence for inclusion: CPA DD confirming that the CPAs are not registered under any other offset Scheme, except the GS and the CDM and that CPAs are neither registered as

	that have been deregistered;		CDM Project activities, included in other PoAs nor the project activities that have been deregistered.
4	Specification of the technology/measure such as the level and type of service, as well as performance specification based on, inter alia, testing/certification;	CPAs under this PoA will consist in the distribution of ICS with a thermal efficiency of at least 20% to users cooking with non-renewable biomass in the baseline scenario. Where charcoal is generated under the PoA, it must be generated in ICS of the type micro gasifier stoves, without auxiliary power consumption in a blower or fan for forced convection. Users of charcoal must be (i) households; or (ii) small and medium enterprises (SMEs); or (iii) a group of households served by a charcoal market (e.g. charcoal consuming urban areas). End users must not include large scale industries.	Evidence for inclusion: The CPA Section A.3 specifies that the technology applied is a portable ICS with an efficiency of about 28% according to the manufacturer's specification. As described in Section B.4 the target groups of ICS users are households and the target groups of charcoal users are small and medium enterprises.
5	Conditions to check the start dates of V/CPAs through documentary evidence;	Any CPA start date shall not be before the PoA starting date which is 07.06.2018 (first notification of prior consideration Form to UNFCCC)	Evidence for inclusion: The CPA start date is 10/09/2018, which is later than the start date of the PoA.
6	Conditions to ensure compliance with the applicability of the applied methodologies, the applied standardized baselines and the other applied methodological regulatory documents	For all CPAs that will be included in this PoA, compliance with the applicability of the applied methodologies, the applied standardized baselines and the other applied methodological regulatory documents and the use of multiple methodologies shall be justified.	Evidence for inclusion: CPA-DD. Evidence for the applicability of specific methodologies described in section B.2.
7	Conditions to ensure that V/CPAs meet the requirements for demonstration of	Additionality will be demonstrated according to the COMMUNITY SERVICES ACTIVITY REQUIREMENTS	It is demonstrated in Section B.2 of the CPA-DD registered under this PoA that:

	additionality	vers1.2 Annex B positive list.	Project activities are solely composed of isolated units where the users of the technology/measure are households or communities or institutions and where each unit results in $\leq 600 \text{ MWh}_{\text{thermal}}$ of energy savings per year or ≤ 600 tonnes of emission reductions per year.
8	Conditions to ensure no diversion of official development assistance	The CME or the CPA operator (in case of being different from the CME) shall confirm that in case of public funding, there is no diversion of Official Development Assistance.	Evidence for inclusion: ODA declaration
9	Target group (e.g. domestic/commercial/industrial, rural/urban, gridconnected/offgrid), and where applicable, distribution mechanisms (e.g. direct installation)	Target groups are users of traditional stoves cooking with non-renewable biomass. Additionally, target groups can be users of charcoal: (i) households; or (ii) small and medium enterprises (SMEs); or (iii) a group of households served by a charcoal market, but not large scale industries. The distribution mechanism is the direct distribution of ICS and possibly also charcoal through the CME or other project partners.	Evidence for inclusion: CPA-DD, describing the target groups in section B.4. Additionally, samples of agreements to be signed with ICS users, confirming that traditional wood stoves were used for cooking in the baseline situation and samples of agreements to be signed with charcoal buyers, shortly describing their business and confirming that they are no large scale industries.
10	Conditions related to sampling requirements for the PoA	Monitoring of all CPAs will adhere to all requirements related to sampling for a PoA in accordance with the sampling standard.	Evidence for inclusion: Sampling plan of the CPA-DD in Section B.7.2.
11	Conditions to ensure that CPAs that will be included meet the small-scale or microscale thresholds and remain within those thresholds throughout the	Project activities are solely composed of isolated units where the users of the technology/measure are households or communities or institutions and where	Evidence for inclusion: Calculation in the CPA-DD showing the compliance with small-scale or microscale thresholds in Section

	crediting period (N/A if all units qualify as "microscale CDM units")	each unit results in ≤ 600 MWh of energy savings per year or ≤ 600 tonnes of emission reductions per year.	B.2.
12	Conditions to be met by each VPA regarding SDG outcomes assessment	Each CPA will comply with the SDG outcome assessment.	Evidence for inclusion: CPA –DD stating the compliance with the SDG outcome assessment. See Section D.1.
13	Conditions to be met by each VPA regarding safeguarding principles	Each CPA will comply with the safeguarding Principles.	Evidence for inclusion: CPA –DD stating the compliance with the safeguarding Principles in D.1.

A.1.2. Legal ownership of products generated by the project and legal rights to alter use of resources required to service the project

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atmosfair has the legal ownership on the verified emission reduction based on contracts between the end users, atmosfair and the CME. The relevant part of the contracts will be provided.

No other rights are affected by the project.

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. Technologies and/or measures

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a) Technologies employed

Technologies implemented by the VPA

The ICS to be implemented in this project activity uses the TLUD Gasifier Cookstove technology. The TLUD will be 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.

The stove implemented in the VPA is manufactured in Kolkata, India. The original stove design was developed in the US. Thus the VPA does result in a technology transfer to the host country.

After the end of the stove, life span cookstoves whose lifetime has ended may be replaced with new project cookstoves for existing VPAs as long as they are replaced within the crediting period. However, creating a new VPA or a new project for the same purpose is not allowed.

At the end of the life span of project devices, one of the following three options will be demonstrated:

- a) Project devices are replaced with the same or more efficient devices;
- b) Project devices are retrofitted/repared i.e. essential parts of the stoves (e.g. the burning chamber) are replaced so as to meet the additional conditions described below.
- c) If none of the conditions above can be demonstrated, no emission reductions can be claimed for the stoves.

If project devices are retrofitted/repared before or at the end of the device's estimated life span, emission reductions may be claimed for these devices during the extended lifetime only if the details of the retrofits/repairs undertaken (e.g. parts replaced, specifications followed, personnel conducting the repairs and date of retrofitting) on each device are documented and in addition, one of the following options is implemented:

- a) Extended lifetime is demonstrated through a warranty from the original manufacturer, or a guarantee from a company with demonstrated experience in cookstove repair that assures the performance of the stove in its entirety comparable to the original device including with regard to efficiency, safety and indoor emissions; or
- b) Extended lifetime or the durability of the retrofitted device is demonstrated through a durability test performed according to requirements in ISO 19867-1 for durability or a comparable national standard. Certification by a relevant national standards body or an

appropriate certifying agent recognized by that body (with reference to Data/Parameter Table 20 of the methodology) may be supplied based on sample tests specified by the standard applied.



Types and levels of services

The TLUD allows for significant savings of firewood compared to traditional stoves and additionally 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 compared to traditional stoves. This means speedy cooking, time and fuel savings, cleaner pans, kitchen walls and indoor atmosphere.

Charcoal generated in the TLUD will be collected from TLUD users and sold to users of conventional charcoal such as manufacturers of incense sticks, barbecue restaurants or to local retailers which will sell to the aforementioned and other SME.. No charcoal will be sold to large-scale industries.

The age and average lifetime

The lifetime of the stove is 7 years according to the manufacturer's specification.

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.

b) Positive contribution to the SDGs

Goal 1. End poverty in all its forms everywhere

Target 1.1 By 2030, eradicate extreme poverty for all people everywhere, currently measured as people living on less than \$1.25 a day.

The stove generates charcoal during the normal cooking task as a waste product of the pyrolysis process. This charcoal can be sold by the stove users to the project partners. The selling of the charcoal generates an additional income for the households. The indicator to measure this goal will be the income generated by the sales of the charcoal.

Goal 7. Ensure access to affordable, reliable, sustainable and modern energy for all

7.1 By 2030, ensure universal access to affordable, reliable and modern energy services

The project is designed to provide cleaner, safer, more affordable and more efficient cooking equipment than traditional stoves to poor household by means of carbon finance. The indicator to monitor the access to affordable and clean energy is the increase in number of households using clean cooking devices such as Improved Cook Stoves.

Goal 8. Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all

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.

The project will lead to economic growth and employment opportunities. Jobs will be created that benefit locals. The number of jobs created will be monitored, and also evidence on the income and equal income for both men and women for the same job, will be provided. The indicator to monitor the target is the number of jobs created by the project activity.

Goal 13. Take urgent action to combat climate change and its impacts

13.2 Integrate climate change measures into national policies, strategies and planning

The efficient cookstoves will use less fuelwood for the cooking task and thus reduce GHG emissions compared to the traditional way of cooking. The indicator to monitor the target is the amount of the reduced GHG emissions annually through the project as contribution to a lower greenhouse gas emission development path of India.

A.4. Scale of the project

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It is a small scale project.

A.5. Funding sources of project

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There is no public funding from Annex I parties for this PoA. ODA Declaration was provided to the GS.

SECTION B. APPLICATION OF APPROVED GOLD STANDARD METHODOLOGY (IES) AND/OR DEMONSTRATION OF SDG CONTRIBUTIONS

B.1. Reference of approved methodology (ies)

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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

B.2. Applicability of methodology (ies)

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1. Small-scale project type applicable to this VPA
 - Type II: Energy efficiency improvement project activities that reduce energy consumption, on the supply and/or demand side, with a maximum energy saving of 60 GWh per year (or an appropriate equivalent) in any year of the crediting period. In this context, for project activities that improve thermal energy efficiency, the maximum energy saving of 60 GWh(e) per year is equivalent to 180 GWh(th) per year saving;
 - Type III: Other project activities not included in Type I or Type II that result in GHG emission reductions not exceeding 60 kt CO₂e per year in any year of the crediting period.
2. Demonstration of qualification for microscale project type:

According to the COMMUNITY SERVICES ACTIVITY REQUIREMENTS vers1.2 Annex B positive list, in order to qualify for automatic additionality, it will be demonstrated in the CPAVPA-DD registered under this PoA, that project activities solely composed of isolated units where:

- the users of the technology/measure are households or communities or institutions and
- each unit results in ≤ 600 MWh of energy savings per year or ≤ 600 tonnes of emission reductions per year.

According to the AMS-II.G par 53, in order to qualify for the micro scale CDM Units , it will be demonstrated in the CPA/VPA-DD that the ICS disseminated under the CPA VPA remain under the threshold of:

- Type II: project activities that aim to achieve energy savings at a scale of no more than 20 GWh(e) corresponding to 60 GWh thermal energy savings per year
- Type III: Other project activities not included in Type I or Type II that aim to achieve GHG emission reductions at a scale of no more than 20 kt CO₂e per year.

Evidence:

Type II			
AMS-II.G	MSc limit project activity	60	GWh therm.
	Wood savings per TLUD	2.89	tons of fuelwood per year
	Energy per ton of fuelwood	0.00433333	GWh/ton, derived from 0.0156 TJ/ton (0.0156 TJ/ton = 0.004333 GWh)
	Energy savings per TLUD	0.0125	GWh_{thermal} per year

Type III			
AMS-III.BG	MSc limit project activity	20,000	tCO ₂ /a
	MSc Limit project activity	20,000	tons of CO ₂
	Quantity of Charcoal produced per	0.34	tons/a

	ICS		
	CF (Wood to charcoal conversion factor)	6	
	Energy per ton of fuelwood	15.60	GJ/ton
	NCVcharcoal,i / NCVcharcoal,default	1	
	fNRB	0.8718	
	EF (emission factor)	0.0637	tons of CO2 per GJ
	SMGy,b	0.03	
	GWP _{CH4}	25	
	Annual emission reduction per ICS	1.76	tCO2/a

In the CPA DD of CPAs registered under the PoA it will be demonstrated that the CPAs are solely composed of “microscale CDM units” below the given microscale thresholds, according to CDM Tool 19 vers. 9.0 paragraph 12(a) and 12(b)(i) along with footnote 15:

12. Energy efficiency project activities that aim to achieve energy savings at a scale of no more than 20 GWh per year are additional if any one of the conditions below is satisfied:

- (a) The geographic location of the project activity is in an LDC/SIDS or SUZ of the host country;*
- (b) The project activity consists of one or more of the following technology/measures related to energy efficiency where end users of the technology/measure are households, communities or SMEs:*
 - (i) High efficiency biomass fired devices (e.g. energy efficient cookstoves)¹⁵;*
 - (ii) Micro-irrigation systems;*
 - (iii) Energy efficient pump-set for agriculture.*

Units distributed under the CPA qualify as 12 b (i) High efficiency biomass fired devices.

Footnote 15: Further conditions to check the penetration rate as specified in appendix of this document applies.

- 1. The penetration of the proposed technology (i.e. Solar water heating system, Clean and energy efficient cookstoves, High efficiency biomass fired devices (e.g. energy efficient cookstoves) and Solar lamps) is equal to or less than 5 per cent of the technologies/measures (providing similar services) in the region in order to be considered as automatically additional.*
- 2. The penetration shall be determined using one of the following options:*
 - (a) Official statistics or reports, relevant industry association reports or peer-reviewed literature;*
 - (b) Results of a sampling survey conducted by project participants or a third party as per the latest version of "Standard: Sampling and surveys for CDM project activities and programme of activities"; covering technologies/measures providing similar services as the project technology/measure.*
- 3. To determine the penetration using the above paragraph, the most recent data available at the time of submission of the CDM-PDD or CDM-CPA-DD for validation/inclusion, shall be used, and the data vintage used shall not include data older than three years prior to:*
 - (a) the start date of the CDM project activity; or*
 - (b) the start of validation/inclusion, whichever is earlier.*

Evidence:

The report "Access to Clean Cooking Energy and Electricity" from 2018 states that just 0.77% of rural households are using an improved biomass cookstove or biogas for cooking, a number which is also referred to in the report "Roadmap for Access to Clean Cooking Energy in India" from 2019. In this report it is also stated that improved biomass cookstoves are not relevant for urban households, so that the penetration rate of 0.77% can be used for whole India.

Therefore, units distributed under this CPA1 do qualify for microscale CDM units. Thus it does not need to demonstrate compliance with the small scale CDM thresholds at the aggregate level of the CPA, which means the CPA is not limited by the number of ICS distributed. The Microscale thresholds are met see clarification under "Table summarizing applicability criteria" below and the distributed unites fulfilling the requirement: <1800MWh/year, <600 tCO₂e/y and end users are Households/communities/SMEs.

- II.G per ICS ca. 0.0125 GWh_{thermal}
- III.BG per ICS ca. 1.76 tCO₂/y

The emission reduction calculations in this CPA DD are carried out with a preliminary assumption of distributed stoves, however more stoves may be included under the CPA.

Confirmation that this CPA under the PoA is a voluntary action

This CPA is a voluntary action by Nature Club of Rajasthan.

Contribution to sustainable development

The CPA will contribute to sustainable development by

- Contributing to the conservation of forest resources in India
- Improving the economic situation of ICS users by reducing their expenses for fuelwood and allowing them to generate income by selling charcoal generated in the ICS.
- Improving health conditions of ICS users due to improved indoor air quality.

Table summarizing applicability criteria:

Criterion	Justification of applicability
AMS-II.G, version 12	
2.1 Para. 2: "This methodology comprises efficiency improvements in thermal applications of non-renewable biomass. Examples of applicable technologies and measures include the introduction of high efficiency biomass	The purpose of the CPA is the distribution of improved cook stoves (ICS) consuming woody biomass, particularly micro gasifier stoves, that are highly efficient in comparison to traditional wood stoves which constitute the baseline scenario. All ICS will replace existing traditional wood stoves.

fired project devices (cookstoves or ovens or dryers) to replace the existing devices and/or energy efficiency improvements in existing biomass fired cookstoves or ovens or dryers."	
2.1 Para. 3: In the case of cookstoves, the methodology is applicable to the introduction of single pot or multi pot portable or in-situ cookstoves with rated efficiency of at least 20 per cent. The Water Boiling Test (WBT) method shall be used to test the efficiency of the cookstove to meet this eligibility requirement, following the requirements indicated in "Data / Parameter table 11" which details the options for testing and certification as well as supporting documentation (e.g. certificate issued by third party or test results) that needs to be presented to the validating DOE.	ICS distributed under the CPA are portable single or multi pot stoves. The thermal efficiency of all stove technologies introduced will surpass 20%; The thermal efficiency will be tested according to AMS-II.G.
2.2 Para. 5: Non-renewable biomass has been used in the project region since 31 December 1989.	The forest cover of India has decimated from nearly 40% of India's geographical area a century ago to 22% in 1951 and to 20.55% in 2001¹. This indicates that large-scale deforestation is prevalent since 1989. Furthermore, it may be noted as per data (tables T1 and T11) from the Global Forest Resources Assessment 2010 (FRA 2010) that the wood removals (Industrial round wood removals + Woodfuel removals) have increased 23.56% from (35,055,000+ 213,169,000 =248,224,000) cubic meters in 1990 to (45,957,000+260,752,000=306,709,000) cubic meters in 2005. State of Forest Report (FSI) report

¹State of Forest Report 2001, <<http://www.fsi.nic.in>>

	in 1987 i.e., prior to 1989 clearly states for India that the firewood consumption in 1987 is estimated at 157 million tonnes or 235 million cu.m.². However, the production of firewood from forests estimated by FSI (Forest Survey of India) is only 40 million cu.m.³. Thus, there was a gap of 195 million cu.m. in demand and production of firewood. Thus it is established that non-renewable biomass has been used in India since 31 December 1989, using official reports of the Government of India. Thus, it is clear from the above arguments that the wood resources in India are constrained with respect to extraction which has increase data much higher rate as compared to increase in forests (including outside forests/wooded land) and non-renewable biomass extraction is prevalent since 1989.
2.2 Para. 4. The aggregate energy savings of a single project activity shall not exceed the equivalent of 60 GWh per year or 180 GWh thermal per year in fuel input. Para. 53. If the CPA consists solely of units that qualify as "microscale CDM units" as defined in the "TOOL19: Demonstration of additionality of microscale project activities", the conditions to ensure that CPAs that will be included meet the small-scale or microscale thresholds and remain within those thresholds throughout the crediting period of the CPAs are not required.	The microscale limit for Type II project units corresponds to 60 GWh of thermal energy savings. Each ICS is expected to save about 2.89 tons of woody biomass annually, corresponding to 0.0125 GWh_{th} per year.
2.2 Para. 6. For cases where the	Not applicable. The purpose of the CPA is the

²<http://www.fsi.nic.in> (page 46; section 3.7)

³<http://www.fsi.nic.in> (page 46; section 3.8)

biomass is sourced from renewable sources, the project participants should use a corresponding Type I methodology	distribution of improved cook stoves (ICS) consuming woody biomass, which is a non-renewable source.
2.2 Para. 7. The CDM-PDD or CDM-PoA-DD/CPA-DD shall explain the proposed method for distribution of project devices including the method to avoid double counting of emission reductions such as unique identifications of product and end-user locations (e.g. programme logo).	Unique numbers will be allocated to each ICS under the PoA allowing unique identification and tracking of the stove. Based on the serial numbers, a stove can only count in one CPA.
The CDM-PDD or CDM-PoA-DD/CPA-DD shall also explain how the proposed procedures prevent double counting of emission reductions, for example to avoid that project stove manufacturers, wholesale providers or others claim credit for emission reductions from the project devices.	Charcoal users will sign agreements stating that they will not claim ER for the use of the charcoal provided under this CPA. Stove users will sign agreements stating that they will not claim ER for the use of the stove and replacement of renewable biomass through renewable biomass provided under this CPA.
AMS-III.BG, version 03	
Para. 2: This methodology is applicable to project activities that displace the use of non-renewable biomass in the production of charcoal supplied to identified consumers for thermal applications included in the project boundary.	Not applicable since para. 3 is applicable; charcoal is produced in micro gasifier stoves as a by-product.
Para. 3: This methodology is also applicable to charcoal generated as a by-product in micro-gasifier stoves using woody biomass for households cooking when used in conjunction with "AMS-II.G: Energy efficiency measures in thermal applications of non-renewable biomass". Auxiliary power consumption in a blower or fan for forced convection	The CPA is designed explicitly for the distribution of micro-gasifier stoves using biomass for cooking and not using auxiliary power in blowers or fans, such as the TLUD technology. The CPA also applies AMS-II.G.

is not covered by the methodology.	
Para. 4: End users of charcoal shall be: (i) households; or (ii) small and medium enterprises (SMEs); or (iii) a group of households served by a charcoal market (e.g. charcoal consuming urban areas). End users do not include large scale industries. Footnote 1: Acceptable evidence include, but are not limited to: sales records and receipts of delivery of charcoal products directly to eligible end-users, long-term contracts with an entity (retailer, cooperative, trader etc.) supplying charcoal products to the eligible end-users.	End users will be identified during monitoring of parameter $Q_{CCP,i,y}$ and evidence will be provided that they belong to categories (i), (ii) or (iii) as mentioned in Para. 4 of AMS-III.BG, excluding large-scale industries. Evidence will be for example an undertaking of the charcoal traders that end users are SMEs, as well as balance sheets of the charcoal traders.
Para. 5: Measures such as contractual agreements shall be implemented to avoid potential double counting because of potential claims of emission reductions by the end users. These measures shall be described in the Project Design Document (PDD)	Charcoal users will sign agreements stating that they will not claim ER for the use of the charcoal provided under this CPA.
Para. 6: . Project activity, except for the case indicated in paragraph 3 above, shall introduce efficient charcoal production technologies using biomass feedstock such as biomass residues to displace the production of charcoal in unimproved traditional kilns by the informal sector thereby leading to emission reductions. Charcoal production facility may include briquetting facility for the agglomeration of smaller biomass particles. Methane produced during charcoaling process is either: (a) captured and destructed or gainfully used for heat or electricity; or	Not applicable since para. 3 is applicable; para. 6 refer to charcoal production in improved kilns, while the CPA is about charcoal generated in micro gasifier stoves.

(b) not captured and not destructed. Examples of these technologies include but are not limited to: (a) Retort sedentary kilns² which capture the pyrolysis gas; captured gas may be gainfully used for example as a fuel for pre-heating the facility or for wood drying or for production of heat and/or power; (b) Improved sedentary kilns without the capture of pyrolysis gas; (c) Casamance kilns.	
Para. 7 Project kilns not equipped with capture and destruction of the pyrolysis gases are not eligible to claim emission reductions on account of avoidance of methane emissions from the project activity under this methodology. It is assumed that methane emissions in the project equals to methane emissions in the baseline charcoal generation process.	Not applicable since para. 3 is applicable; para. 7 refer to charcoal production in improved kilns, while the CPA is about charcoal generated in micro gasifier stoves.
Para. 8: The project activity shall install and operate new (Greenfield) charcoal production facilities characterized by a new investment; replacement and retrofit of existing facilities is not eligible under this methodology. Provisions of "General guidelines for SSC CDM methodologies" shall be applied to demonstrate that the most plausible baseline scenario is the production of charcoal in unimproved traditional kilns by the informal sector.	Not applicable since the CPA is about charcoal generated in micro gasifier stoves.
Para. 9: Charcoal manufacturing equipment transferred from existing or decommissioned charcoal production facilities are not eligible.	Not applicable since the CPA is about charcoal generated in micro gasifier stoves.
Para. 10: The biomass utilized by the	Not applicable since no biomass is used explicitly

project activity shall not be chemically processed, not stored for more than one year and not stored in anaerobic conditions.	for charcoal production; charcoal generated under this CPA is a by-product from cooking.
Para. 11: Biomass used by the project facilities is not stored for more than one year. No storage of the biomass is done in anaerobic conditions.	Not applicable since no biomass is used explicitly for charcoal production; charcoal generated under this CPA is a by-product from cooking.
Para. 12: The embedded energy in charcoal produced as by-product in micro-gasifier stoves shall be neglected when performing water boiling test as per AMS-II.G to ensure that efficiency estimates are conservative..	Charcoal produced is not considered for calculating stove efficiency.
The microscale limit for AMS-III.BG corresponds to 20,000 tons. Para. 46. If the CPA consists solely of units that qualify as "microscale CDM units" as defined in the "TOOL19: Demonstration of additionality of microscale project activities", the conditions to ensure that CPAs that will be included meet the small-scale or microscale thresholds and remain within those thresholds throughout the crediting period of the CPAs are not required.	The corresponding microscale limit of 20,000 tons of annual CO2 reduction per ICS is met, as the total amount of conventional charcoal to be replaced annually is approximately 1.76 tons per ICS.

B.3. Project boundary

>>

	Source	GHGs	Included?	Justification/Explanation
Baseline scenario	Cooking on traditional stoves with fuelwood	CO ₂	Yes	Important source of emissions
		CH ₄	No	Important source of emissions, but excluded for the sake of conservativeness, according to AMS-II.G.
		N ₂ O	No	Excluded for the sake of conservativeness.
		...		
	Use and production of conventional charcoal	CO ₂	Yes	Included according to AMS-III.BG for traditional charcoal production, for the share of charcoal produced with biomass deemed renewable.
		CH ₄	Yes	Included for the fraction of renewable biomass used in the project device.
		N ₂ O	No	Excluded for the sake of conservativeness.
		...		
Project scenario	Cooking on traditional stoves with fuelwood	CO ₂	Yes	Important source of emissions
		CH ₄	No	Important source of emissions, but excluded for the sake of conservativeness, according to AMS-II.G.
		N ₂ O	No	Excluded for the sake of conservativeness.
		...		
	Use and production of conventional charcoal	CO ₂	Yes	Included according to AMS-III.BG for traditional charcoal production, for the

			share of charcoal produced with biomass deemed renewable.
	CH ₄	Yes	Included for the fraction of renewable biomass used in the project device.
	N ₂ O	No	Excluded for the sake of conservativeness.
	...		

B.4. Establishment and description of baseline scenario

>>

As per AMS-II.G, version 12, AMS-III.BG, version 03, it is formally assumed that in the absence of the project activity, the baseline scenario would be the use of fossil fuels for meeting similar thermal energy needs. Therefore, emission reductions are calculated by multiplying the thermal energy from annual biomass savings stemming from non-renewable biomass with an emission factor for fossil fuels.

Regarding the efficiency component (AMS-II.G), the vast majority of the population in the project area uses fuel wood in traditional stoves, without improved combustion air supply, grate or chimney, to reach their thermal energy needs. The target population of the project consists only in fuelwood users, this is guaranteed by asking potential users if they are using fuelwood. Moreover, the use of a wood stove would not be attractive for LPG or kerosene users. The baseline therefore consists in the consumption of fuel wood for cooking on traditional stoves.

Regarding the charcoal generation component (AMS-III.BG), the project aims at replacing conventional charcoal used by different consumers eligible under AMS-III.BG such as barbecue restaurants, manufacturers of incense sticks, tobacco driers (bidi factories) or to local retailers which will sell to the afore mentioned and other SME. Such users traditionally use conventional charcoal produced from unsustainably harvested fuelwood. A default conversion factor of 6 defined in AMS-III.BG is applied for the consumption of fuelwood to produce conventional charcoal which represents the baseline for the charcoal component (i.e., it is assumed that 6 kg of fuelwood are needed to produce 1 kg of charcoal). ER will only be claimed for charcoal generated as a by-product in cooking in ICS for which ER are also claimed under AMS-II.G. Since this charcoal will be used outside the ICS, according to AMS-III.BG, charcoal will not be considered in the WBT when evaluating the ICS's efficiency. Another element of the baseline scenario of this component consists in methane generation from traditional open-ended charcoal production methods for conventional charcoal

replaced by the CPA. According to equation 1, para 21 of AMS-III.BG, this methane generation is considered for the portion of charcoal produced from the fraction of biomass deemed renewable.



Picture: TLUD users with charcoal generated within a fortnight

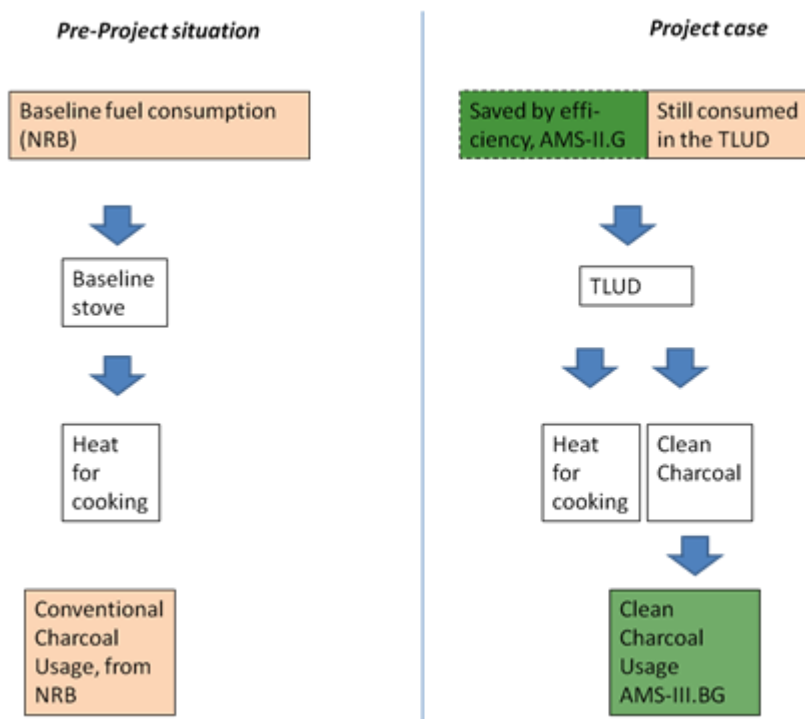


Diagram illustrating the baseline scenario of the CPA

B.5. Demonstration of additionality

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Specify the methodology, activity requirement or product requirement that establishes deemed additionality for the proposed project (including the version number and the specific paragraph, if applicable).	According to the applied Methodology AMS-II.G, the additionality of the Project activity is demonstrated according to the CDM Methodological tool TOOL19: Methodological tool: Demonstrating additionality of microscale project activities.
Describe how the proposed project meets the criteria for deemed additionality.	Additionality is demonstrated by demonstrating that the CPA is solely composed of microscale CDM units below the given microscale thresholds in the "Methodological tool: Demonstrating additionality of microscale project activities" CPA-DD section A.1, showing that the units applied under the CPA are all below the microscale thresholds for the corresponding project Type.

B.5.1. Prior Consideration

>>

N/A

B.5.2. Ongoing Financial Need

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N/A

B.6. Sustainable Development Goals (SDG) outcomes

Relevant Target/Indicator for each of the three SDGs

Sustainable Development Goals Targeted	Most relevant SDG Target	SDG Impact
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		Indicator (Proposed or SDG Indicator)
Goal 1. End poverty in all its forms everywhere	1.1 By 2030, eradicate extreme poverty for all people everywhere, currently measured as people living on less than \$1.25 a day.	Income generated by the sales of charcoal
Goal 7. Ensure access to affordable, reliable, sustainable and modern energy for all	7.1 By 2030, ensure universal access to affordable, reliable and modern energy services	Number of households using clean cooking devices such as Improved Cook Stoves.
Goal 8. Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all	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.	Number of jobs created in the project
Goal 13. Take urgent action to combat climate change and its impacts	N/A	Emission reductions

B.6.1. Explanation of methodological choices/approaches for estimating the SDG Impact

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Goal 1: Target 1.1:

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

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.

Goal 7: Target 7.1:

The parameter to monitor the access to affordable and clean energy is the number of households using clean cooking devices such as Improved Cook Stoves and thus the number of ISC sold in the project. 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.

Goal 8: Target 8.5:

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

Goal 13: Target:13.2:

Emission reductions are calculated by summarizing ER from the stove efficiency-component (applying AMS-II.G) and the charcoal-production-component (applying AMS-III.BG).

(equation 1)

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

Where:

ER_{total}	Total emission reductions of the CPA
$ER_{II.G}$	Emission reductions of the stove efficiency component
$ER_{III.BG}$	Emission reductions of the charcoal generation component

Subscripts "i" referring to stove types are omitted in this CPA-DD since only one type of ICS (TLUD) will be distributed in this CPA.

According to AMS-II.G para 14, batch is defined as follows:

Batch - is defined as the population of the device of the same type commissioned during a certain period of time (e.g. week or month) in a certain calendar year. 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.

Emission reductions from the Stove Efficiency Improvements Component (AMS-II.G)

It is formally assumed that in the absence of the project activity, the baseline scenario would be the use of fossil fuels for meeting similar thermal energy needs. Therefore, emission reductions are calculated by multiplying the thermal energy from annual biomass savings stemming from non-renewable biomass with an emission factor for fossil fuels.

The following equation applies as per AMS-II.G par. 24:

(equation 2)

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

Where:

i	=	Indices for the situation where more than one type of project device is introduced to replace the pre-project devices ⁴
j	=	Indices for the situation where there is more than one batch of project device
ER _y	=	Emission reductions during year y (tCO ₂ e)
ER _{y,i,j}	=	Emission reductions by project device of type i and batch j during year y (tCO ₂ e)

⁴ For example, in some instances, full replacement of the pre-project device would require the implementation of more than one project device (e.g. one stove suitable for cooking and the other stove suitable for cooking/boiling water).

LE_y = Leakage emissions in the year y (tCO₂e)

and

equation (3)

$$ER_{y,i,j} = B_{y,savings,i,j} \times N_{0,i,j} \times n_{y,i,j} \times \mu_y \times f_{NRB,y} \times NCV_{biomass} \times EF_{projected_fossil\ fuel}$$

Where:

$B_{y,savings,i,j}$	= Quantity of woody biomass that is saved per cookstove device of type i and batch j during year y (tonnes)
$f_{NRB,y}$	= Fraction of woody biomass that can be established as non-renewable biomass ⁵ (fraction or %)
$NCV_{biomass}$	= Net calorific value of the non-renewable woody biomass that is substituted (IPCC default for wood fuel, 0.0156 TJ/tonne, based on the gross weight of the wood that is 'air-dried')
$EF_{projected_fossilfuel}$	= Emission factor of fossil fuels projected to be used to substitute non-renewable woody biomass by similar consumers (tCO ₂ e/TJ).
$N_{0,i,j}$	= Number ⁶ of project devices of type i and batch j commissioned (number)
$n_{y,i,j}$	= Proportion of commissioned project devices of type i and batch j ($N_{0,i,j}$) that remain operating in year y (fraction)
μ_y	= Adjustment to account for any continued use of pre-project devices during the year y

$N_{0,i,j}$ is monitored directly, for $NCV_{biomass}$ and $EF_{projected_fossilfuel}$, the indicated default values are used, and LE_y is set to zero, since leakage is considered by multiplying $B_{y,savings,i,j}$ with net to gross adjustment factor of 0.95. μ_y is set to 1, since equation 8 of AMS-II.G vers. 12 is used. $n_{y,i,j}$ is monitored and not considered in the per stove ER calculation (thus set 1 here).

⁵ Default values endorsed by designated national authorities and approved by the Board are available at <http://cdm.unfccc.int/methodologies/standard_base/index.html>.

$B_{y,savings,i,j}$ and $f_{NRB,y}$ are determined as follows:

Determination of $B_{y,savings,i,j}$

According to AMS-II.G, four options are given to determine $B_{y,savings,i,j}$. Here, the third option (para 32, WBT) is chosen, with the corresponding formula (equation 8 of AMS-II.G version 12):

(equation 4)

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

Where:

- $B_{y=1,new,i,survey}$ = Quantity of woody biomass used by project devices in tonnes per device of type i and batch j (tonnes)
- $\eta_{old,i,j}$ = Efficiency of the old devices being replaced by project devices of type i and batch j (fraction)
- $\eta_{new,i,j}$ = Efficiency of the project device i and batch j (fraction)
Charcoal generated in the ICS will not be considered to derive η_{new} if this charcoal will be used outside the ICS, according to AMS-III.BG.

Combined equation for $ER_{II.G,y}$

(equation 5)

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

Determination of the Share of Non-Renewable Biomass

According to methodological TOOL30 vers.2, par. 8, the following equation shall be used to calculate f_{NRB} :

(equation 6)

$$f_{NRB,y} = \frac{NRB}{NRB + RB}$$

Where:

- $f_{NRB,y}$: Fraction of non-renewable biomass in the country/region or project area (fraction or %)
- NRB: Quantity of non-renewable biomass (t/yr) determined paragraphs 10 and 11 of the TOOL 30
- RB: Quantity of renewable biomass (t/yr)

$$NRB = H - RB$$

Where:

- H = Total annual consumption of wood in the absence of the project activity in the country/region/project area, determined as per section 4.1 a of tool 30 (t/yr): (a) Official statistics or reports or peer-reviewed literature;

$$RB = \sum (MAI_{forest,i} \times (F_{forest,i} - P_{forest})) + \sum (MAI_{other,i} \times (F_{other,i} - P_{other}))$$

Where

- $MAI_{forest,i}$ Mean Annual Increment of woody biomass growth per hectare in sub-category i of forest areas (t/ha/yr)
- $MAI_{other,i}$ Mean Annual Increment of woody biomass growth per hectare in sub-category i of other wooded land areas (t/ha/yr)
- $F_{forest,i}$ Extent of forest in sub-category i (ha)
- $F_{other,i}$ Extent of other wooded land in sub-category i (ha)
- P_{forest} Extent of non-accessible area (e.g. protected area where

	extraction of wood is prohibited, geographically remote area) within forest areas (ha)
P_{other}	Extent of non-accessible area (e.g. protected area where extraction of wood is prohibited, geographically remote area) within other wooded land areas (ha)
i	Sub-category i of forest areas and other wooded land areas

Determination of H			
Type of Wood	Unit	Wood consumption	Source
Fuelwood	000 tons/y	2,519	http://fsi.nic.in/isfr19/vol1/chapter10.pdf
Fodder	000 tons/y	21.209	http://fsi.nic.in/isfr19/vol1/chapter10.pdf
Bamboo	000 tons/y	45.47	http://fsi.nic.in/isfr19/vol1/chapter10.pdf
Small timber Volume	cum/	134,946	http://fsi.nic.in/isfr19/vol1/chapter10.pdf
Wood Density "Shorea robusta" in t/cum	t / cum	0.72	2006 IPCC
Small timber Mass	000 tons/y	97	Calculated
Total H West Bengal	Mio t/yr	23.87	

Calculation of RB		Tropical					Subtropical
	Unit	Rain Forest	Moist	Dry	Shrub	Mountain	Mountain
$F_{forest,i}$ ⁷	%	13%	11%	56%	9%	7%	5%
$MAI_{forest,i}$ ⁸	(t/ha/yr)	4.6	5.5	3.8	3.2	1.9	1.9

⁷ FAO 2000:Table 14. Distribution of total forest area by ecological zone - India (%); <http://www.fao.org/3/y1997e/y1997e21.htm>

⁸ 2006 IPCC - Guidelines for National Greenhouse Gas Inventories - ABOVE-GROUND NET BIOMASS GROWTH IN NATURAL FORESTS; https://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/4_Volume4/V4_04_Ch4_Forest_Land.pdf

Mai_{forest,i} *(F_{forest,i}-P_{forest})⁹	ha	0.48	0.48	1.69	0.23	0.11	0.08
Total RB West Bengal	Mio t/yr	3.06					

RB	Mio t/yr	3.06
H	Mio t/yr	23.87
NRB	Mio t/yr	20.81
f_NRB	0.8718	

Leakage

According to AMS-II.G para. 41 the default net to gross adjustment factor of 0.95 is applied to account for leakage and therefore surveys are not required.

Emission reductions from the charcoal generation component (AMS-III.BG)

AMS-III.BG. will be applied according to the provisions for charcoal production in micro gasifier stoves.

The applicable main formula given in AMS-III.BG version 03 is:

(equation 7)

$$ER_{III.BG,y} = \sum_i Q_{CCP,i,y} \times \left[\left(CF \times NCV_{wood} \times \frac{NCV_{charcoal}}{NCV_{charcoal,default}} \times f_{NRB,BL,wood} \times EF_{projected_fossilfuel} \right) + (SMG_{y,b} - M_d) \times (1 - f_{NRB,BL,wood}) \times GWP_{CH4,y} \right] - PE_{y,fugitive} - PE_{y,flaring} - PE_{FF,y} - PE_{El,y} - PE_{BC,y}$$

⁹ FSI - 2019 - West Bengal Forest Cover = 1.173.000 ha - 0.377.200 ha Protected forests; <http://fsi.nic.in/isfr19/vol2/isfr-2019-vol-ii-west-bengal.pdf>

Where

$ER_{III.BG,y}$	= Emission reductions in year y (t CO ₂ e/yr)
$Q_{CCP,i,y}$	= Quantity of charcoal type i produced and used in year y (t)
CF	= Default wood to charcoal conversion factor
NCV_{wood}	= Net calorific value of wood(TJ/t)
$NCV_{charcoal}$	= Net calorific value of the charcoal produced during the project (TJ/t)
$NCV_{charcoal,default}$	= Default net calorific value of charcoal (TJ/t)
$f_{NRB,BL,wood}$	= Fraction of biomass used in the absence of the project activity that can be established as non-renewable biomass; determined as per the procedure found in the latest version of AMS-I.E. Determined here as described in this section B.6.1 under AMS-II.G.
$EF_{projected_fossilfuel}$	= Emission factor for the substitution of non-renewable woody biomass by similar consumers (t CO ₂ /TJ)
$GWP_{CH_4,y}$	= Global warming potential of methane applicable to the crediting period (t CO ₂ e/t CH ₄)
$SMG_{y,b}$	= Specific methane generation for the baseline charcoal generation process in the year y; a default value of 0.030 t CH ₄ /t charcoal may be used.
M_d	= Factor to account for any legal requirement for capture and destruction of methane in the charcoal production facility (tonne of CH ₄ /tonne of raw material)

$PE_{y,flaring}$	= If applicable, emissions due to the flare inefficiency. In case captured pyrolysis gas is gainfully used (e.g. used for production of heat as in the case of micro-gasifier), then it can be taken as zero.
$PE_{FF,y}$	= Project emissions due to fossil fuel consumption in charcoal production facilities in year y (t CO ₂)
$PE_{El,y}$	= Project emissions due to electricity consumption in charcoal production facilities in year y (t CO ₂)
$PE_{BC,y}$	= Project emissions due to biomass cultivation in year y (t CO ₂)

$PE_{y,flaring}$ is not applicable since pyrolysis gas is used for cooking. M_d is set to zero since there is obviously no legal requirement to capture methane in micro gasifier stoves. $PE_{FF,y}$ and $PE_{El,y}$ are not considered since no fossil fuels or electricity are used in the ICS; $PE_{BC,y}$ is not applicable since no biomass will be cultivated for charcoal production since it is produced as a by-product of daily cooking.

$PE_{y,fugitive}$ is calculated as follows :

(equation 8)

$$PE_{y,fugitive} = \sum_i Q_{CCP,iy} \times GWP_{CH_4,y} \times SMG_{y,b} \times f$$

Where

$PE_{y,fugitive}$	= Fugitive emissions from operation of charcoal producing facility (physical leakage) in the year y (t CO ₂ e)
f	= A fraction attributed to project charcoal production technology, use a default value of 0.1.

Equations 7 and 8 can thus be combined and simplified:

(equation 9)

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

$f_{NRB,y}$ is determined as described in this section B.4.1 under AMS-II.G.

Leakage:

Since charcoal generated in ICS is a by-product of daily cooking, there are no leakage effects. According to the methodological tool (EB83, annex 15), para. 22, "competing uses for biomass are not relevant, where the biomass is generated as part of the project activity".

B.6.2. Data and parameters fixed ex ante

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	$NCV_{charcoal,default}$
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	$f_{NRB,y}$
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	64.4; the more conservative value of 63,71 may be used to be in line with the CDM CPA DD (Default value as provided by AMS II.G version 10, par.17).
Choice of data or Measurement methods and procedures	Default value as provided by AMS II.G version 12, par.24
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_{CH_4}
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	$SMG_{y,b}$
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	-

B.6.3. Ex ante estimation of SDG Impact

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Goal 1: Target 1.1:

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

For ex-ante estimate of the SDG outcome we assume an average yearly collection of 338 kg charcoal per household, and a price of 8 INR per kg charcoal.

Resulting in:

2,704 INR per year through the sale of the charcoal. So all 30,000 households together earn a sum of 81,129,000 INR in the first year.

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.

For ex-ante estimate of the SDG outcome we assume to distribute 30,000 stoves per year under the VPA.

Goal 8: Target 8.5:

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

For ex-ante estimate of the SDG outcome we assume to create about 220 jobs, calculating to 31 jobs per year. 180 people for the charcoal chain and 40 people for the maintenance work.

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 (see B.6.1):

(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 (see B.7.1).

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**.

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

QCCP_{i,y} will be monitored, it is preliminarily set to 340kg (20.20% % of B_{y=1,new,survey}) per ICS. 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	Value
A	B_{y=1,new,survey}	Monitored	tons/a	
B	η_{new,j} (efficiency of the project device batch j implemented as part of the project activity from a WBT without considering remaining charcoal)	Monitored	%	
C	η_{old} (efficiency of replaced stove)	AMS-II.G default	%	
D	L_y : Discount for leakage	AMS-II.G		
E	B_{savings} per stove	A * ((B/C) - 1) * D	tons/a	
F	N_{0,i,j}	Monitored		
G	n_{y,i,j}	Monitored		
H	f_{NRB} : fraction of non-renewable biomass	NRB/(NRB+DRB), for West Bengal	%	
I	EF_{projected_fossilfuel}	AMS-II.G default	tCO2/TJ	
J	NCV_{biomass or wood}	AMS-II.G default	TJ/t	0
ER_{II.G} per ICS		E*F*G*H*I*J	tons/a	
K	Q_{CCP,i,y} : Quantity of charcoal produced and used	Monitored	tons	
L	CF : Conversion factor wood to charcoal	AMS-II.G defaults, IPCC guidelines		

M	$NCV_{charcoal} / NCV_{charcoal,default}$	Default value for $NCV_{charcoal}$ according to AMS-III.BG		
N	$SMG_{y,b}$	Default given in AMS-III.BG.		
O	GWP_{CH4}	Default IPCC value		
ER_{III.BG} per ICS for use of charcoal replacing charcoal		$K*((L*J*M*H*I)+(N*(0.9-H)*O))$	tCO ₂ /a	
Possible total ER per ICS			tCO₂/a	

ER for a population of ICS will be calculated considering $N_{0,i,j}$ and $n_{y,i,j}$.

B.6.4. Summary of ex ante estimates of each SDG outcome

SDG 1: Income for the households generated by the sales of the charcoal in INR.

Year	Baseline estimate	Project estimate	Net benefit
From 01/03/2020	0	67,600,000	67,600,000
2021	0	81,120,000	81,120,000
2022	0	81,120,000	81,120,000
2023	0	81,120,000	81,120,000
2024	0	81,120,000	81,120,000
2025	0	81,120,000	81,120,000
2026	0	81,120,000	81,120,000
Till 28/02/2027	0	13,520,000	13,520,000
Total	0	567,840,000	567,840,000
Total number of crediting years	7		
Annual average over the crediting period			81,120,000

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

Year	Baseline	Project	Net benefit
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	estimate	estimate	
From 01/03/2020	0	30,000	30,000
2021	0	30,000	30,000
2022	0	30,000	30,000
2023	0	30,000	30,000
2024	0	30,000	30,000
2025	0	30,000	30,000
2026	0	0	0
Till 28/02/2027	0	0	0
Total	0	240,000	240,000
Total number of crediting years	7		
Annual average over the crediting period			34,286

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

Year	Baseline estimate	Project estimate	Net benefit
From 01/03/2020	0	26	26
2021	0	31	31
2022	0	31	31
2023	0	31	31
2024	0	31	31
2025	0	31	31
2026	0	31	31
Till 28/02/2027	0	5	5
Total	0	220	220
Total number of crediting years	7		
Annual average over the crediting period			31

SDG 13: Emission Reductions

Year	Baseline estimate	Project estimate	Net benefit
From 01/03/2020	253,701	0	253,701
2021	417,269	0	417,269
2022	524,457	0	524,457
2023	626,285	0	626,285
2024	723,022		723,022
2025	814,921	0	814,921
2026	774,175		774,175
Till 28/02/2027	122,578	0	122,578
Total	4,256,408	0	4,256,408
Total number of crediting years	7		
Annual average over the crediting period			608,058

B.7. Monitoring plan

B.7.1. Data and parameters to be monitored

SDG 13

Data / Parameter	$B_{y=1,new,survey}$
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	1.69

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 $n_{new,j}$. $B_{y=1,new,survey}$ will be calculated as follows: $B_{y=1,new,survey} = fillings_{y=1} * load_{y=1} * 0.365$ (conversion factor to from kg /day to t/afillings_{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}: 4.27 load_{y=1}, : 1.087 kg $B_{y=1,new,survey} = fillings_{y=1} * load_{y=1} * 0.052$ $B_{y=1,new,survey} = 4.27 * 1,087kg * 0.365 = 1.69$
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	Monitored, assumption for Ex-Ante Emission Calculation: 28%
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. In case the establishment of “batches” is chosen for ER calculation, efficiency will be determined using para AMS II G vers. 12, 37 c. All stoves distributed before the registration of the CPA DD will be included in the first batch (commissioning date is the CPA inclusion date).

	Stoves sold after the inclusion date will for efficiency testing be grouped by the year of their commissioning (stove age classes). According to AMS-II.G para 37 c efficiency will be determined only for the oldest group of stoves. The determined efficiency value will be used for ER calculation for all stove batches included in the efficiency group. In case no batches are established for ER calculation, 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. All WBTs will be conducted under field conditions. Several WBTs will be conducted on randomly selected ICS; the sample size of ICSs testes will be large enough to meet the requirements of the sampling standard. A single test run will be conducted for each ICS tested. Where ER are claimed under AMS-III.BG. for the use of charcoal outside the ICS, the WBT results will be 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 will be collected using the standard procedures and will be stored for the crediting period and an additional two years. Only calibrated equipment will be used, according to requirements in the project standard.
Purpose of data	Calculation of baseline emissions

Additional comment	In case batches are chosen for ER calculation: The stove groups (stove age classes) used for the efficiency calculation are not the identical with the batches defined for the definition of the commissioning date. Stove groups used for efficiency calculation will be defined by the year of commissioning of the stoves included in the group (e.g. all stoves sold in 2020 will be grouped and a random subsample will be drawn for the determination of the efficiency of stoves of this age class). All stoves sold before the CPA inclusion date belong to the same age class, since their commissioning date is the same (date of CPA inclusion). These are the oldest stoves for which according to AMS-II.G para 32 c annual efficiency needs to be determined.
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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	Assumption for Ex-Ante Emission Calculation: 30,000 stoves per year
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: $N_{0,i,j} = N_{soldtotal,y,j} * d_{average,y} / m_{length,y}$ 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	In case the establishment of "batches" is chosen for ER calculation, the latest date of commissioning of a device within the batch shall be used as the date of commissioning for the entire batch. In case no batches are established, the commissioning date of each device is the sales date of the device.

Data / Parameter	$n_{y,i,j}$
Unit	Fraction
Description	Proportion of commissioned project devices of type i and batch j ($N_{0,i,j}$) that remain operating in year y (fraction)
Source of data	Monitored

Value(s) applied	0.95 for ex-ante calculation, based on the experience of drop-out rate of 5% in similar projects (GS 1296 project (MP6; 0% drop out and conservative assumption).
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	In the per stove ER calculation provided in section B.6.3 the parameter was not considered and thus set 1. the parameter is considered in the overall ER calculation including N_{0ij} and $n_{y,i,j}$

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	Preliminary value: 0.34
Measurement methods and procedures	The parameter will be monitored according to one of 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

	Option 2: Calculation of the total weight of charcoal supplied; based on the total number of bags supplied (e.g. using systematic sampling method). Option 2 will only be used if Option 1 is not available. $Q_{CCP,i,y}$ will be 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. Where invoicing to charcoal buyers cannot be based on the exact weight but on the number of bags delivered, the following formula will apply: $Q_{CCP,i,y} = \text{weightbags}_{y,i} * \text{nbags}_{y,i}$ Where: weightbags_{y,i} average weight of bags of charcoal type i in period y nbags_{y,i} total number of bags of charcoal type i in period y nbags_{y,i} will be determined based on invoices/receipts of charcoal buyers. weightbags_{y,i} will be determined on sample basis in accordance with the sampling standard. 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	-

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. For the purpose of ex ante calculation, IPCC default value can be used.
Value(s) applied	29.5
Measurement methods and procedures	Option 1: 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. Option 2: using one of the options provided in appendix 1 of AMS.III.BG v3.0.

	As charcoal generated from micro gasifier, Option 1 above or option 2 in 'appendix 1-(Determination of net calorific value of charcoal) of AMS.III.BG v3.0 will be used.
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	In case the establishment of "batches" is chosen for ER calculation, all stoves distributed before the registration of the CPA DD will be included in the first batch (commissioning date is the CPA inclusion date). Stoves sold after the inclusion date will for the determination of the commissioning date be separated in monthly batches. Preliminary value in batches: e.g. commissioning date batch 1: date of CPA inclusion, Commissioning date batch 2: last day of the month following CPA inclusion month. In case no batches are established for ER calculation, the commissioning date of each stove is the day of the respective sales date of the stove.
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 1.9.2018
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	$N_{d,HH}$
Unit	Number
Description	Number of project devices distributed per household
Source of data	Stove data base (Internal records)
Value(s) applied	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	81,120,000
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	Monitored, For ex-ante calculation 31 jobs per year based on an estimation .
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.

B.7.2. Sampling plan

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There will be a continuous documentation of all ICS distributions and charcoal collection in a centralized database. For the preparation of monitoring reports, samples will be drawn from the centralized database and the corresponding stoves will be examined regarding the relevant parameters. Charcoal generation will be monitored through invoices/receipts from charcoal sales, moreover there the weight of charcoal bags will possibly be sampled.

Each ICS will be given a unique ID. This ID will consist in a letter and a number of at least four digits.

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

Central stove database

A central stove database will be operated and maintained by the CME and/or PP to ensure completeness and accuracy of monitoring information. The basic information for ICSs distributed to households will be:

- 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 will be updated continuously, whenever new data (distribution contracts) are available. Original copies of the distribution contracts (or whatever format is used to collect the data required) will be kept and maintained for two years after the end of the crediting period.

As for charcoal sales, there will be 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 will be provided by the CME and/or PP and shall be inserted in the distribution contract at the moment of distributing the stove.

It is planned to make the unique numbers visible on the ICSs, for example by blowtorching numbers on the stove material.

Direct Monitoring

The following parameters will be monitored directly, as described in B.5.1, thus no sampling is necessary: $N_{o,i,j}$ and $QCCP_{i,y}$ (where possible). Where $QCCP_{i,y}$ is based on the number and average weight of bags $nbags_{y,i}$ and $weightbags_{y,i}$, the former parameter will be based on invoices/receipts in charcoal sales and the latter on sampling (see below).

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 will be selected randomly for site visits in order to check the following monitoring parameters:

Proportional parameters:

- $n_{y,i,j}$

Mean parameters:

- $new_{i,j}$
- $load_y$
- $fillings_y$
- $weightbags_{y,i}$ (where applicable, used to determine $QCCP_{i,y}$)

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

$n_{y,i,j}$, $n_{new,i,j}$, $load_y$ and $fillings_y$. will be called "parameters directly related to ICS" in the following text, in order to differentiate them from $weightbags_{y,i}$.

Sampling Plan

The Sampling Plan outlined below is in accordance with the standard for sampling and surveys for CDM project activities and programme of activities (EB 50 Annex 30 STAN, version 05.0).

1. Sampling Design
 - a. Objective and Reliability Requirements
 - i. Objective of the sampling effort

Due to the high number of ICS to be deployed an annual check of all appliances is not feasible. Sampling methods will also be applied to determine the annual or biennial values for $n_{y,i,j}$, $n_{new,i,j}$, $load_y$ and $fillings_y$.

Where applicable, also $weightbags_{y,i}$ will be determined by sampling.

- ii. Timeframe

The time frame for the parameters, i.e. annual or biennial, depends on selected inspection frequency which is at discretion of the CME and/or PP provided confidence/precision requirements are met, according to AMS-II.G, par. 48.

- iii. Estimated parameter values

The estimated parameter values are as per the values used for ex-ante calculation of emission reductions (please refer to Section B.4.3 of the this VPA-DD).

iv. Sampling requirements as per sampling standard and applicable methodology
Precedence of methodology

Par. 9 of the Sampling Standard, EB 50 Annex 30 STAN, version 07.0 clarifies that “[...] any requirements specified in the applicable methodologies having precedence”.

Coverage of sampling requirements in the applicable methodology:

As per applicable methodology AMS-II.G ver. 10. 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.

v. Confidence/precision criteria to be met

Please see above.

Note: As per par. 48 of AMS-II.G the lower bound can also be used instead of repeating the survey efforts to achieve the required confidence/precision level

b. Target Population

i. Definition

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.

ii. Description of particular features associated with it (if applicable)

There are no particular features associated with the target population.

c. Sampling method

i. Description and justification of selected sampling method

For all sampled parameters directly related to stoves, the sampling procedure is a simple random sampling process, which samples households across all the VPAs. Multi-stage sampling may be applied if deemed suitable by the CME and/or PP. Where $weightbags_{y,i}$ is sampled, probably cluster sampling will be applied, because charcoal will probably be collected from households by different field assistants who will use standardized bags and store them separately before selling them, thereby representing clusters.

The CME and/or PP will determine the number of users/appliances/ (charcoal bag clusters) monitored during sampling for each of the parameters separately. Different sample sizes are expected due to different variations of values. To reduce monitoring efforts, where possible, a common sample will be drawn from the central database based on which different parameters shall be monitored. As already stated above, the database may include stoves from several CPAs VPAs and a sample may be drawn

across VPAs. The largest number for the sample size will be chosen for the sampling effort with one common survey for $n_{y,i,j}$. For the monitoring of $\eta_{new,i,j}$, which will probably require smaller sample sizes, a random sub-sample from the common sample will be drawn according to the calculated sample size of the parameter. In cases where the required precisions cannot be met with the original sample, additional random samples will be drawn.

Alternatively, the lower bound can also be used instead of conducting additional surveys to achieve the required confidence/precision level.

Random distribution

The method of selecting users to be included in the sample for deployed ICS will be random using simple random sampling or multistage sampling. For sampling of weightbags $_{y,i,r}$, probably clusters of charcoal bags will be selected randomly. 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.

ii. Identification of strata or clusters if applicable

Optionally, multistage sampling may be conducted. For each monitoring period y contact details from users are collected. In order to obtain a final representative selection, the study area may for example be divided into geographical units. A sample of villages may be selected randomly for each monitoring period y from the sample database by "probability proportional to size"-sampling, i.e. units with a higher number of appliances deployed will have a higher chance to be selected than those with a smaller number of appliances. Within the selected units, ICS users will then be selected randomly.

For sampling of weightbags $_{y,i,r}$, probably clusters of charcoal bags consisting in bags on stock with field assistants collecting charcoal will be selected randomly.

d. Sample size: Estimated target number of units and justification

The following assumptions are applied to calculate the sample size for the different sampling options. Please note: The assumptions are valid at time of submitting the

PoA-DD for registration and the specific VPA-DD for inclusion. If at the time of sampling, more up to date figures or information is available (e.g. from previous monitoring campaigns or from other projects applying the same technology or updated guidance or best practice examples by the EB), it can be applied to do a more accurate sampling and may be used to determine the sample size. Justification will be provided to the verifying DOE.

Expected parameter values

Parameter of interest	Expected value	Source	Estimated standard deviation	Source of estimated SD
$n_{y,i,j}$	xxx	xxx	xxx	xxx
$\eta_{new,i,j}$	xxx	xxx	xxx	xxx
load _y	xxx	xxx	xxx	xxx
fillings _y	xxx	xxx	xxx	xxx

Simple random sampling

Equations used for calculation of sample size according to CDM-EB67-A06-GUID vers.04.0:

Proportional parameter: $n_{y,i,j}$

$$n \geq \frac{z^2 N \times p(1-p)}{(N-1)E^2 \times p^2 + z^2 p(1-p)}$$

Where:

n	Sample size
z	Z value for confidence level (e.g. 1.645 for 90% confidence level)
N	Total number of households
p	Expected proportion
E	Relative precision (e.g. 0.1 for 10% precision)

Mean parameters $\eta_{new,i,j}$, load_y, fillings_y

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

Where:

V	$\left(\frac{SD}{mean}\right)^2$
n	Sample size
N	Total number of households
mean	Our expected mean
SD	Our expected standard deviation
E	Relative precision (e.g. 0.1 for 10% precision)
z	Z value for confidence level (e.g. 1.645 for 90% confidence level)

Estimated sample size according to equations above:

Parameter	Timeframe, CPA frame	Confidence/Precision	Estimated value	Standard deviation	Estimated Sample Size	Applied sample size
$n_{y,i,j}$	Biennial and/or across CPA	95/10	xxx	xxx	xxx	xxx
$\eta_{new,i,j}$			xxx	xxx	xxx	xxx
fillings _y			xxx	xxx	xxx	xxx
load _{y,}			xxx	xxx	xxx	xxx
$n_{y,i,j}$	one CPA, annual	90/10	xxx	xxx	xxx	xxx
$\eta_{new,i,j}$			xxx	xxx	xxx	xxx
fillings _y			xxx	xxx	xxx	xxx
load _{y,}			xxx	xxx	xxx	xxx

The largest number for the sample size, in this case the sample size calculated for $n_{y,i,j}$, will be chosen for the sampling effort with one common survey for all parameters. For the monitoring of all other parameters, a random sub-samples from the common sample will be drawn according to the calculated sample size of the parameter.

In order to account for non-respondents, the initial sample drawn will be at least 20% higher than the minimum sample size.

Cluster Sampling

Cluster sampling may be applied in order to determine the average size of charcoal bags, $\text{weight}_{y,i}$. Charcoal is collected in standardized (probably 25kg) bags by several field assistants during the monitoring period and sold to charcoal users. A cluster of charcoal bags is thus defined as all charcoal bags on stock with one field assistant at the time of the sampling campaign. Such clusters will be selected randomly, and within each cluster, all charcoal bags on stock would be weighed (probably between 20 and 80). Cluster sampling is applicable here because bags are not numbered, therefore it would be difficult to do a transparent random selection of bags within the stock of a field assistant.

Bags will probably be standardized to 25kg, therefore, a relatively small standard deviation is expected. Moreover, the weight of charcoal bags will be checked by charcoal buyers who have a commercial interest in not receiving smaller quantities than invoiced.

The formula to calculate the sample size in cluster sampling (according to CDM-EB67-A06-GUID vers. 04.0, par 35, equation 13) is:

$$c \geq \frac{1.645^2 MV}{(M-1) \times 0.1^2 + 1.645^2 V}$$

Where:

$$V = \left(\frac{SD}{\text{Cluster mean}} \right)^2$$

M = Total number of clusters (50 villages)

1.645 = Represents the 90% confidence required

0.1 = Required precision

In consequence, the expected sample sizes are:

Parameter	Timeframe	Confidence/ Precision	Estimated cluster	Expected Standard	Estimated number of	Applied number of

			mean	deviation	clusters	clusters
weightbags_{y,i}	Biennial	95/10	xxx	xxx	xxx	xxx
weightbags_{y,i}	and/or across one CPA, annual	90/10	xxx	xxx	xxx	xxx

In order to account for non-respondents, the initial sample drawn will be at least 20% higher than the minimum sample size.

Multi-Stage Sampling

No sufficient data are available for an example sample size calculation. The following sampling framework provided for multistage sampling is according to EB 67 Annex 06 GUID vers.04.0, Guideline of sampling and surveys for CDM project activities and programme of activities.

The sampling approach of multistage sampling samples households of one VPA. Sampling across several VPAs is also possible when the same ICS type is deployed under these VPAs. In order to obtain a representative selection of stoves to be monitored, the total population of appliances is divided into sub-groups e.g. geographical units like villages. In a first step of multistage sampling a representative number of sub-groups is randomly selected. In a second step a pre-determined number of households will be randomly selected from within the selected sub-groups. These sampled households will be monitored.

The multistage sampling can be extended further to three or more stages.

Step 1.

The sample size on the sub-groups level will be calculated after the formula given in EB 67 Annex 06 GUID vers.04par. 41 Equation 16:

$$c \geq \frac{\frac{SD_B^2}{\bar{p}} \times \frac{M}{M-1} + \frac{1}{\bar{u}} \times \frac{SD_w^2}{\bar{p}} \times \frac{(\bar{N}-\bar{u})}{(\bar{N}-1)}}{\frac{E^2}{z^2} + \frac{1}{M-1} \times \frac{SD_B^2}{\bar{p}}}$$

Where:

- c Number of sub-groups to be sampled
- M Total number of sub-group
- $\bar{u}$ Number of units to be sampled per sub-group (pre-specified as 10 HH)
- $\bar{N}$ Average Number of units per sub-group
- SD_B^2 Unit variance (e.g. variance between villages)
- SD_W^2 Average of the sub-group variances (average within village variation)
- $\bar{p}$ Overall proportion
- E Relative precision (e.g. 0.1 for 10% precision)
- Z value for confidence level (e.g. 1.645 for 90% confidence level, 1,96 for 95% confidence interval)
- z

The framework for calculation of c for the parameter $n_{y,i,j}$ will for example be the following:

Cluster	Stoves deployed	Proportion p of cook stoves in operation (DOy)	Variance within State ($\pi(1-\pi)$)
A	N_A	p_A	a
B	N_B	p_B	b
C	N_C	p_C	c
D	N_D	p_D	d
E	N_E	p_E	e
F	N_F	p_F	f
G	N_G	p_G	g
$\bar{N}^*$	$(N_A + N_B + N_C + N_D + \dots)/M$		
$\bar{p}^*$		$(p_A + p_B + p_C + p_D + \dots)/M$	
SD_B^{2*}		See below	
SD_W^{2*}			See below
M (number of clusters)	M		

	AMS-II.G Annual	AMS-II.G Biennial	PoA Single S- Plan
	90/10	95/10	95/10
z	1.645	1.96	1.96
E	0.1	0.05	0.1

* Calculated values

$$SD_W^2 = \frac{a+b+c+d+...}{M}$$

$$SD_B^2 = \frac{\sum_{i=1}^n (p_i - \bar{p})^2}{n-1}$$

For different pre-defined number of units to be sampled per sub-groups ($\bar{u}$), different sample sites for c will result:

Example results table with input parameter u

u (number of HH per cluster)	Required number of clusters (c)	Total number of HH
10	xxx	xxx
20	xxx	xxx
25	xxx	xxx
30	xxx	xxx
40	xxx	xxx

In order to account for non-respondents, the initial sample drawn will be at least 20% higher than the minimum sample size.

Which of the sub-groups will be included in the sample is determines by “probability proportional to size”-sampling, i.e. sub-groups with a higher number of appliances deployed will have a higher chance to be selected than those with a smaller number of appliances.

Step 2.:

The households to be sampled within the selected sub-groups c , will be selected by simple random sampling by means of a computerized randomizer.

e. Sampling Frame

i. Identification or description of sampling frame

For parameters that are directly ICS-related, the sampling frame is the list containing all ICSs included until the end of the specific monitoring period.

For the monitoring parameter $\text{weightbags}_{y,i}$, the sampling frame consists in the total number of charcoal bags sold to charcoal users in a monitoring period, as documented by invoices/receipts, for which the average weight shall be determined.

ii. List of sampling frame (if known)

The full list of all ICSs included will only be available after the end of the specific monitoring period. At the time of submitting the PoA for registration and the first specific CPA VPA for inclusion, there is no complete list available since full roll-out of stove deployment will only happen after PoA registration.

Example of the sampling frame for directly ICS-related parameters:

Serial number (Stove-ID) of system	Delivery date of appliance (to user)	User details (Name, Address, etc.)	Administrative unit
1	xx/xx/2xxx	XXX	XXX
2	xx/xx/2xxx	XXX	XXX
3	xx/xx/2xxx	XXX	XXX
...	...	...	...

Example of the sampling frame for $\text{weightbags}_{y,i}$:

Field assistant number	Field assistant contact details (Name, Address, etc.)	Charcoal bags collected from ICS users and sold to charcoal user
1	xx/xx/2xxx	XXX
2	xx/xx/2xxx	XXX
3	xx/xx/2xxx	XXX

2.Data to be collected

a. Field Measurement

i. Identification of all variables to be measured

The following variables are measured for determining the parameter values of:

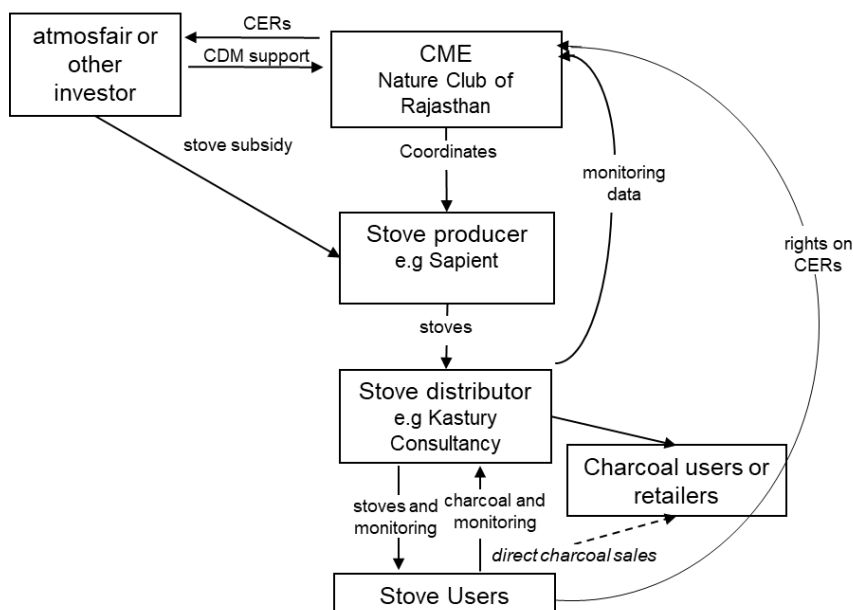
Variable	Parameters	Description
$n_{y,i,j}$	$n_{y,i,j}$	Statistically adjusted drop out from total population of appliances in period y
$\eta_{new,i,j}$	$\eta_{new,i,j}$	Average efficiency of an ICS
$B_{y=1,new,survey}$	$fillings_y$	Number of fillings per week
	$load_{y,i}$	Average load per filling
$Q_{CCP,i,y}$	$weightbags_{y,i}$	Average filling of a standardised charcoal bag
	$nbags_{y,i}$	Number of bags, not sampled, taken from receipts/invoices of charcoal sales

B.7.3. Other elements of monitoring plan

>>

a) Operational and management structure to implement the monitoring plan

The following diagram includes the currently planned management structure of the monitoring.



- a) Provisions to ensure that data monitored and required for verification and issuance are kept and archived for at least two years after the end of the final crediting period or the last issuance of CERs, whichever occurs later

The CME and/or PP will define a numbering system for ICSs to be. The unique numbers allocated to each ICS under the PoA allow unique identification and tracking of the stove.

The CME and/or PP will operate and maintain an electronic record keeping system for each VPA under the PoA. The CME and/or PP will store all data required for verification and issuance in digital form on a central server. Additionally all original data (e.g. interview forms) will be stored by the entity who conducted the monitoring, most probably the stove distributor.

- b) Definition of responsibilities and institutional arrangements for data collection and archiving.

Roles and responsibilities

The CME and/or PP, will be, inter alia, the actor responsible for coordinating and managing the implementation of the monitoring plan.

There will be a person dedicated by the CME coordinating monitoring and data management, for example, coordinating the monitoring surveys and the analysis of collected data.

Training and capacity development

The CME coordinates training for all the staff and external VPA implementers involved in the monitoring. Training is needed to ensure that monitoring activities are conducted as per requirements.

SECTION C. DURATION AND CREDITING PERIOD

C.1. Duration of project

C.1.1. Start date of project

>>

The starting date is 10/09/2018, with the sale/commissioning of the first ICS (stove ID: 70501).

C.1.2. Expected operational lifetime of project

>>

7 years

C.2. Crediting period of project

C.2.1. Start date of crediting period

>>

The crediting period will start at the date of CDM inclusion of the CPA in the PoA.

C.2.2. Total length of crediting period

>>

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

SECTION D. SUMMARY OF SAFEGUARDING PRINCIPLES AND GENDER SENSITIVE ASSESSMENT

D.1. Safeguarding Principles that will be monitored

Not applicable.

D.2. Assessment that project complies with GS4GG Gender Sensitive requirements

Question 1 - Explain how the project reflects the key issues and requirements of Gender Sensitive design and implementation as outlined in the Gender Policy?	Please see table below
---	------------------------

Question 2 - Explain how the project aligns with existing country policies, strategies and best practices	The project has a focus on a fair and equal involvement of woman. The project will employ women mainly in the stove assembly in the factory. Women will have full access to project resources, entitlements and benefits. See reply on Question 3.
Question 3 - Is an Expert required for the Gender Safeguarding Principles & Requirements?	no
Question 4 - Is an Expert required to assist with Gender issues at the Stakeholder Consultation?	no

Social & Economic Safeguarding Principles				
3.2 – Gender Equality and Women’s Rights	Is there a possibility that the Project might reduce or put at risk women’s access to or control of resources, entitlements and benefits?	No	The project will employ women mainly in the stove assembly in the factory. Women will have full access to project resources, entitlements and benefits. Women and men will have equal access opportunities to the new stove sets.	Not applicable
3.2 – Gender Equality and Women’s Rights	Is there a possibility that the Project can adversely affect men and women in marginalised or vulnerable communities (e.g., potential increased burden on women or social isolation of men)?	No	Among the project’s main goals is decreasing women’s burden of time spent on wood collection and cooking by reducing fuel wood consumption. Women will save time which they can utilize for other activities. Women and men will save economic resources since families’ expenditure on fuel wood will decrease. Further, the risk of exposure to gender-based violence will reduce due to the reduction in fuel wood gathering time and distances travelled. The additional income for households through the charcoal selling may also lead to an attenuation of	Not applicable.

			social differences.	
3.2 – Gender Equality and Women’s Rights	Is there a possibility that the Project might not take into account gender roles and the abilities of women or men to participate in the decisions/designs of the project’s activities (such as lack of time, child care duties, low literacy or educational levels, or societal discrimination)?	No	The project distributes efficient cookstoves, which are designed to use less firewood than the traditional stoves. Therefore, the stove saves women’s time for fuelwood collection and for cooking and frees time for other tasks or undertakings. All users, especially women are given the opportunity to comment on e.g. the stove design through after sales service, independently of educational level etc.	
3.2 – Gender Equality and Women’s Rights	Does the Project take into account gender roles and the abilities of women or men to benefit from the Project’s activities (e.g., Does the project criteria ensure that it includes minority groups or landless peoples)?	No	Both women and men in the project households are encouraged to make use of the project technology and to take part in the training given. The project aims to improve the livelihood of the entire community. Discrimination of minority groups or landless people are not tolerated. Stoves are distributed to a subsidized price, to reach as many people as possible with the project technology.	Not applicable
3.2 – Gender Equality and Women’s Rights	Does the Project design contribute to an increase in women’s workload that adds to their care responsibilities or that prevents them from engaging in other activities?	No	Among the project’s main goals is decreasing women’s burden of time spent on wood collection and cooking by reducing fuel wood consumption. Women will save time which they can utilize for other activities.	Not applicable.
3.2 – Gender Equality and Women’s Rights	Would the Project potentially reproduce or further deepen discrimination against women based on gender, for instance, regarding their full	No	The project will involve women in the project activities by providing training on the implementation of the project (stoves assembly) and women are empowered economically through the created job	

	participation in design and implementation or access to opportunities and benefits?		opportunities. Women and youths will be the main beneficiaries of the project. The project will therefore reduce the discrimination and exclusion of women in economic activities	
3.2 – Gender Equality and Women’s Rights	Would the Project potentially limit women’s ability to use, develop and protect natural resources, taking into account different roles and priorities of women and men in accessing and managing environmental goods and services?	No	Among the project’s main goals is decreasing women’s burden of time spent on wood collection and cooking by reducing fuel wood consumption. Forest resources will thus be protected, especially by women. Additionally the charcoal sold by the households will substitute convention charcoal and thus protect even more forest resources and the corresponding environmental services.	Not applicable
3.2 – Gender Equality and Women’s Rights	Is there likelihood that the proposed Project would expose women and girls to further risks or hazards?	No	Through the project activity, the risk of exposure to gender-based violence will reduce due to the reduction in fuel wood gathering time and distances travelled.	Not applicable

SECTION E. SUMMARY OF LOCAL STAKEHOLDER CONSULTATION

The below is a summary of the 2 step GS4GG Consultation for monitoring purposes. Please refer to the separate Stakeholder Consultation Report for a complete report on the initial consultation and stakeholder feedback round.

The Local stakeholder consultation was carried out on VPA level for a group of VPAs. The meeting was held on 12th August 2018 at 10 am at:

C/o Ananda Sing
Village: Bahirtafa
Post Office: Jadurberia
Police Station: Uluberia

Howrah, West Bengal, India

Pin Code: 711316

The LSC shall be valid for all VPAs which are located in the same region and using the same stove technology, since the technology and its impacts will be similar in the entire region and for users using the same new stove technology.

The local stakeholder consultation was conducted before the start date of each VPA. The stakeholder feedback round was conducted from 21/09/2018 – 21/11/2018.

E.1. Summary of stakeholder mitigation measures

>>

N/A

E.2. Final continuous input / grievance mechanism

Method	Include all details of Chosen Method (s) so that they may be understood and, where relevant, used by readers.
	Ayub Ali Mondal, Moulindu Banerjee Opp: Sahidulla College, Berachampa, Deganga, North 24 Parganas
Continuous Input / Grievance Expression Process Book (mandatory)	C/o Ananda Sing Village: Bahirtafa Post Office: Jadurberia Police Station: Uluberia Howrah, West Bengal, India Pin Code: 711316
GS Contact (mandatory)	help@goldstandard.org
Phone access	Moulindu Banerjee 919830192424 Ayub Ali Mondal 919733902911
Internet/email access	sapientinfo1970@gmail.com

Other	Ayub Ali Mondal, Moulindu Banerjee Opp: Sahidulla College, Berachampa, Deganga, North 24 Parganas
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APPENDIX 1 - SAFEGUARDING PRINCIPLES ASSESSMENT

Complete the Assessment below and copy all Mitigation Measures for each Principle into [SECTION D](#) above. Please refer to the instructions in the [Guide to Completing](#) this Form below.

Assessment Questions/ Requirements	Justification of Relevance (Yes/potentially/no)	How Project will achieve Requirements through design, management or risk mitigation.	Mitigation Measures added to the Monitoring Plan (if required)
Principle 1. Human Rights			
1. The Project Developer and the Project shall respect internationally proclaimed human rights and shall not be complicit in violence or human rights abuses of any kind as defined in the Universal Declaration of Human Rights 2. The Project shall not discriminate with regards to participation and inclusion	no	The project is a voluntary action of the project developer and the partners. Users can freely decide if they want to buy a stove and thus be part of the project activity.	N/A
Principle 2. Gender Equality			
1. The Project shall not directly or indirectly lead	no	The project will employ local women and distribute	

to/contribute to adverse impacts on gender equality and/or the situation of women 2. Projects shall apply the principles of nondiscrimination, equal treatment, and equal pay for equal work 3. The Project shall refer to the country's national gender strategy or equivalent national commitment to aid in assessing gender risks 4. (where required) Summary of opinions and recommendations of an Expert Stakeholder(s)		stoves to vulnerable communities. - Especially women are involved in the project, since cooking is mainly done by women. Also in the factory, women will be employed. Literacy is not necessary, as the use of the stoves will be explained vocally at the time of purchase and during the consultation meeting. - Through less time spent in wood collection and cooking the workload for women gets less. - Through the project activity, the risk of exposure to gender-based violence will reduce due to the reduction in fuel wood gathering time and distances travelled.	
Principle 3. Community Health, Safety and Working Conditions			
1. The Project shall avoid community exposure to		The project is a household based clean cookstove project.	

increased health risks and shall not adversely affect the health of the workers and the community		Thus no increased health risks or negative affects on the workers or the community is expected. To the contrary, the clean cookstoves will improve air quality by reducing indoor air pollution while cooking. Also the project does not adversely influence the health of workers. Safety provisions are taken for the assembly of the cookstoves.	
Principle 4.1 Sites of Cultural and Historical Heritage			
Does the Project Area include sites, structures, or objects with historical, cultural, artistic, traditional or religious values or intangible forms of culture?		The project is a household based clean cookstove project, thus the project does not involve or be complicit in the alteration, damage or removal of any sites, objects or structures of significant cultural heritage. Cooking habits and dishes do not need to change.	
>>			
Principle 4.2 Forced Eviction and Displacement			
Does the Project require or cause the physical or economic relocation of peoples		The project is a household based clean cookstove project, thus the project does not	

(temporary or permanent, full or partial)?		involve physical or economic relocation of peoples	
>>			
Principle 4.2 Forced Eviction and Displacement			
Does the Project require or cause the physical or economic relocation of peoples (temporary or permanent, full or partial)?		The project is a household based clean cookstove project, thus the project does not involve physical or economic relocation of peoples	
>>			
Principle 4.3 Land Tenure and Other Rights			
Does the Project require any change, or have any uncertainties related to land tenure arrangements and/or access rights, usage rights or land ownership?		The project is a household based clean cookstove project, thus the project does not require change to land tenure arrangements and/or other rights	
>>			
Principle 5. Corruption			
1. The Project shall not involve, be complicit in or inadvertently contribute to or reinforce corruption or corrupt Projects		The project does not involve, is not complicit in, does not contribute inadvertently to and does not reinforce corruption or corrupt Projects.	

Principle 6.1 Labour Rights			
1. The Project Developer shall ensure that all employment is in compliance with national labour occupational health and safety laws and with the principles and standards embodied in the ILO fundamental conventions 2. Workers shall be able to establish and join labour organisations 3. Working agreements with all individual workers shall be documented and implemented and include: a) Working hours (must not exceed 48 hours per week on a regular basis), AND b) Duties and tasks, AND c) Remuneration (must include provision for payment of overtime), AND		2. The project does not involve and is not complicit in any form of forced or compulsory labour. The project participants do not complicit in any form of forced or compulsory labour. 3. Each employee of the project is free to associate with whomever he wants. 4. Employees of the project will have working contracts with the local partners in the project country. The contracts will be according to the national regulations and is thus locally and culturally appropriate 5. Project participants and all	

d) Modalities on health insurance, AND e) Modalities on termination of the contract with provision for voluntary resignation by employee, AND f) Provision for annual leave of not less than 10 days per year, not including sick and casual leave. 4. No child labour is allowed (Exceptions for children working on their families' property requires an Expert Stakeholder opinion) 5. The Project Developer shall ensure the use of appropriate equipment, training of workers, documentation and reporting of accidents and incidents, and emergency preparedness and response measures		involved parties do not employ children. 6. The project participants will provide appropriate equipment for assembly of the stoves as well as safety material (gloves, first aid kit). The project partners will provide and document training of workers employed in the project.	
---	--	--	--

Principle 6.2 Negative Economic Consequences			
1. Does the project cause negative economic consequences during and after project implementation?		No risks are foreseen for the local economy through the realisation of the project, since stoves are not distributed for free but need be purchased by the users.	
>>			
Principle 7.1 Emissions			
Will the Project increase greenhouse gas emissions over the Baseline Scenario?		The project does not lead to an increase in greenhouse gas emissions above the baseline emissions. The efficient cook stoves will reduce the release of CO2 emissions compared to the traditional three stone fires.	
>>			
Principle 7.2 Energy Supply			
Will the Project use energy from a local grid or power supply (i.e., not connected to a national or regional grid) or fuel resource (such as wood, biomass) that provides for other local users?		The project does not use energy from the local grid or power supply that is also being used by other users; hence it does not affect the availability and reliability of energy supply to other users.	
>>			

Principle 8.1 Impact on Natural Water Patterns/Flows			
Will the Project affect the natural or pre-existing pattern of watercourses, ground-water and/or the watershed(s) such as high seasonal flow variability, flooding potential, lack of aquatic connectivity or water scarcity?		There will be no direct impact on the water body through the project.	
>>			
Principle 8.2 Erosion and/or Water Body Instability			
Could the Project directly or indirectly cause additional erosion and/or water body instability or disrupt the natural pattern of erosion?		There will be no direct impact on the water body through the project.	
>>			
Principle 9.1 Landscape Modification and Soil			
Does the Project involve the use of land and soil for production of crops or other products?		The project is a household based clean cookstove project, thus the project does not involve the use of land and soil for production of crops or other products.	
>>			
Principle 9.2 Vulnerability to Natural Disaster			

Will the Project be susceptible to or lead to increased vulnerability to wind, earthquakes, subsidence, landslides, erosion, flooding, drought or other extreme climatic conditions?		The project is a household based clean cookstove project, thus the project is not susceptible to or lead to increased vulnerability to wind, earthquakes, subsidence, landslides, erosion, flooding, drought or other extreme climatic conditions	
>>			
Principle 9.3 Genetic Resources			
Could the Project be negatively impacted by or involve genetically modified organisms or GMOs (e.g., contamination, collection and/or harvesting, commercial development, or take place in facilities or farms that include GMOs in their processes and production)?		The project is a household based clean cookstove project, thus the project is not negatively impacted by or involve genetically modified organisms.	
>>			
Principle 9.4 Release of pollutants			
Could the Project potentially result in the release of pollutants to the environment?		The project is a household based clean cookstove project, thus the project does not result in the release of	
>>			

		pollutants to the environment.	
Principle 9.5 Hazardous and Non-hazardous Waste			
Will the Project involve the manufacture, trade, release, and/ or use of hazardous and non-hazardous chemicals and/or materials?		The project is a household based clean cookstove project, thus the project does not involve the manufacture, trade, release, and/ or use of hazardous and non-hazardous chemicals and/or materials.	
>>			
Principle 9.6 Pesticides & Fertilisers			
Will the Project involve the application of pesticides and/or fertilisers?		The project is a household based clean cookstove project, thus the project does not involve the application of pesticides and/or fertilisers.	
>>			
Principle 9.7 Harvesting of Forests			
Will the Project involve the harvesting of forests?		The project is a household based clean cookstove project, thus the project does not involve the harvesting of forests.	
>>			
Principle 9.8 Food			
Does the Project modify the quantity or nutritional quality of food available such as		The project is a household based clean cookstove project, thus the project does not	

through crop regime alteration or export or economic incentives?		modify the quantity or nutritional quality of food available such as through crop regime alteration or export or economic incentives.	
>>			
Principle 9.9 Animal husbandry			
Will the Project involve animal husbandry?		The project is a household based clean cookstove project, thus the project does not involve animal husbandry.	
>>			
Principle 9.10 High Conservation Value Areas and Critical Habitats			
Does the Project physically affect or alter largely intact or High Conservation Value (HCV) ecosystems, critical habitats, landscapes, key biodiversity areas or sites identified?		The project is a household based clean cookstove project, thus the project does not physically affect or alter largely intact or High Conservation Value (HCV) ecosystems, critical habitats, landscapes, key biodiversity areas or sites identified.	
>>			
Principle 9.11 Endangered Species			
Are there any endangered species identified as potentially being present within the Project boundary (including those that may route through		The project is a household based clean cookstove project, thus the project does not impact oareas where endangered species may be	

the area)? AND/OR Does the Project potentially impact other areas where endangered species may be present through transboundary affects?		present through transboundary affects or endangered species directly.	
>>			

APPENDIX 2- CONTACT INFORMATION OF VPA IMPLEMENTER

Organization name	atmosfair gGmbH
Registration number with relevant authority	
Street/P.O. Box	Zossener Strasse 55-58
Building	
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Contact person	Katrin Mikolajewski
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APPENDIX 3-SUMMARY OF APPROVED DESIGN CHANGES

Please refer to Annex A of [Principles and Requirements](#) for more information on procedures governing Design Changes

Not applicable

Revision History

Version	Date	Remarks
1.1	7 October 2020	Hyperlinked section summary to enable quick access to key sections Improved clarity on Key Project Information Inclusion criteria table added Gender sensitive requirements added Prior consideration (1 yr rule) and Ongoing Financial Need added Safeguard Principles Assessment as annex and a new section to include applicable safeguards for clarity Improved Clarity on SDG contribution/SDG Impact term used throughout Clarity on Stakeholder Consultation information required Provision of an accompanying Guide to help the user understand detailed rules and requirements
1.0	10 July 2017	Initial adoption