



Component project activity design document form
(Version 09.0)

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

BASIC INFORMATION

Title of the CPA	Improved cook stoves and sustainable charcoal initiative, CPA 1
Scale of the CPA	☐ Large-scale ☒ Small-scale
Version number of the CPA-DD	3
Completion date of the CPA-DD	20/06/2020
Title and UNFCCC reference number of the registered CDM PoA	PoA 10516: Improved cook stoves and sustainable charcoal initiative
Title and reference number of the corresponding generic CPA	Generic CPA 2: Improved cook stoves and sustainable charcoal initiative, XXX
Coordinating/managing entity	Nature Club of Rajasthan
Host Party	India
Applied methodologies and standardized baselines	AMS-II.G. ver. 10 - Energy efficiency measures in thermal applications of non-renewable biomass AMS-III.BG. ver. 3 - Emission reduction through sustainable charcoal production and consumption
Sectoral scopes linked to the applied methodologies	3: Energy demand 5: Chemical industries
Estimated amount of annual average GHG emission reductions	608,055 tCO ₂ e

SECTION A. Description of component project activity (CPA)

A.1. Purpose and general description of CPA

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.

The location and technologies/measures employed by the CPA

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

The project boundary

The project boundary of this CPA is West Bengal, India

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.

Estimates of annual average and total GHG emission reductions for the chosen crediting period

Annual average over the crediting period 608,055 (tCO₂e)

Additional specific instructions for generic small-scale CPAs:

1. Small-scale project type applicable to this CPA

- 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 Project Standard V.2.0 (CDM-EB93-A07-STAN, par. 124) and AMS-II.G par 41, in order to qualify for the micro scale additionality demonstration, it will be demonstrated in the CPA-DD that the ICS disseminated under the CPA 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	A	MSc limit project activity	60	GWh therm.
	B	Wood savings per TLUD	1.69	tons of fuelwood
	C	Energy per ton of fuelwood	0.00417	GWh/ton, derived from 15 GJ/ton (15 GJ = 0.00417 GWh)
		Energy savings per TLUD (=B*C*1,000)	7.05	kWh

Type III				
AMS-III.BG	D	MSc limit project activity	20,000	tCO ₂ /a
	E	Quantity of Charcoal produced per ICS	0.34	tons/a
	F	CF (Wood to charcoal conversion factor)	6	
	G	Energy per ton of fuelwood	15.60	GJ/ton
	H	NCV _{charcoal,i} / NCV _{charcoal,default}	1	
	I	fNRB	0.8718	
	J	EF (emission factor)	0.0637	tons of CO ₂ per GJ
	K	SMG _{y,b}	0.03	
	L	GWP _{CH4}	25	
		Annual emission reduction per ICS (=E*((F*G*H*I*J)+(K*(0.9-I)*L))	1.77	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 2018¹ 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 units fulfilling the requirement: <1800MWh/year, <600 tCO₂e/y and end users are Households/communities/SMEs.

- II.G per ICS ca. 7.05kWh/year
- III.BG per ICS ca. 1.77 tCO₂/y

The emission reduction calculations in this CPA DD are carried out with a preliminary assumption of 30.000 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 10	
2.1 Para. 2: " This methodology comprises	The purpose of the CPA is the distribution of

¹ Jain et al. 2018, p.58: Access-to-Clean-Cooking-Energy-and-Electricity-Survey of the States 2018-1

efficiency improvements in thermal applications of nonrenewable biomass. Examples of applicable technologies and measures include the introduction of high efficiency biomass 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."	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; therefore, no greenfield installations are included. (as requested in footnote 1).
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 with the WBT. The MSME test results confirming the TLUD stoves a thermal efficiency of 28%.
2.2 Para. 2: 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 2001. 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 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. . However, the production of firewood from forests estimated by FSI (Forest Survey of India) is only 40 million cu.m. . 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 increased at a 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	The microscale limit for AMS-II.G corresponds to 60 GWh of thermal energy savings. Each ICS is expected to save 1.69 tons of woody biomass annually, corresponding to 7.05 kWh per year.

input.	The CPA is solely composed of microscale CDM units. The penetration rate of the energy efficiency units applied by the CPA is 0.77% and such less than 5% of the technologies in the region and thus qualify as microscale CDM units.
2.2 Para. 6. For cases where the biomass is sourced from renewable sources, the project participants should use a corresponding Type I methodology	Not applicable. The purpose of the CPA is the distribution of improved cook stoves (ICS) consuming woody biomass, which is a non-renewable source.
2.2 Para. 7. If the project device requires a specific fuel for this device (e.g. briquettes, pellets, woodchips), the consumption of the fuel should be monitored during the crediting period.	If the device would require a specific fuel the consumption would be monitored through the crediting period through the monitoring survey. Fillings and load per device.
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 is not covered by the methodology.	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 (see section A.3 of the PoA-DD). The CPA also applies AMS-II.G.
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	Not applicable since para. 3 is applicable; para. 6

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 (b) not captured and not destructed. Examples of these technologies include but are not limited to: (a) Retort sedentary kilns ² 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.	refer to charcoal production in improved kilns, while the CPA is about charcoal generated in micro gasifier stoves.
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 project activity shall not be chemically processed, not stored for more than one year and not stored 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. 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 (see paragraph 17 of AMS-II.G, version 6) 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..	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 1.77 tons CO2 per ICS. The CPA is solely composed of microscale CDM units. The penetration rate of the energy efficiency units applied by the CPA is 0.77% and such less than 5% of the technologies in the region and thus qualify as microscale CDM units.

A.2. Location of CPA

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The project activity will be implemented in several villages and households in the state of West Bengal, India.

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 CPA, corresponding to the red part.

A.3. Technologies/measures

1. Technologies implemented by the CPA

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.



2. 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 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 or tobacco driers (bidi factories). No charcoal will be sold to large-scale industries.

3. The age and average lifetime

The stove is manufactured for long-time usage (more than 7 years).

4. The existing efficiencies

The TLUD ICS has a thermal efficiency of over 20%. The ICSs 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 ICSs 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%.

5. 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.

6. 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.

The baseline scenario is equal to the current practise.

A.4. Coordinating/managing entity

Nature Club of Rajasthan (An Action Group For Nature Conservation)

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DURGAPURA, Jaipur – 302 01

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Chief Functionary: Dr. Rituraj Sharma

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A.5. Parties and CPA implementers

Parties involved	CPA implementers	Indicate if the Party involved wishes to be considered as CPA implementer (Yes/No)
India	Nature Club of Rajasthan	no
Germany	atmosfair gGmbH	Yes

A.6. Public funding of CPA

There will be no public funding of the CPA.

A.7. History of CPA

We confirm that:

- (a) The proposed CPA is neither registered as a CDM project activity nor included in another registered CDM PoA
- (b) The proposed CPA is not a project activity that has been deregistered.

2. Declare whether:

- (a) The proposed CPA was a CPA that has been excluded from a registered CDM PoA;
 - No
- (b) A registered CDM project activity or a CPA under a registered CDM PoA whose crediting period has or has not expired (hereinafter referred to as former project) exists in the same geographical location as the proposed CPA.
 - No

A.8. DebundlingDebundling Check

Since the CPA solely comprises “microscale CDM units” as defined in the “Methodological tool: Demonstration of additionality of microscale project activities”, the requirement regarding debundling is not applicable.

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

The activity applies two small scale baseline and monitoring methodologies:

- AMS-II.G, version 10²: “Energy Efficiency Measures in Thermal Applications of Non-Renewable Biomass”. This methodology will be applied in any case.
- AMS-III.BG version 03³: “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 CPA-DD, it is referred to the versions mentioned above.

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

Source		GHG	Included?	Justification/Explanation
Baseline	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.

²<https://cdm.unfccc.int/methodologies/DB/DP2BYDIV6RTMZPEZ2EDLYGLJDPSSU3>

³<http://cdm.unfccc.int/methodologies/DB/MVOAXD3LGD4ZJEKEERCT39ZLJ3JZA0>

Source		GHG	Included?	Justification/Explanation
Project activity	Use and production of conventional charcoal	N ₂ O	No	Excluded for the sake of conservativeness.

		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	No	Excluded for the sake of conservativeness.
		N ₂ O	Yes	Important source of emissions
	Cooking on efficient cookstoves	---		
		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 sustainable 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	No	Excluded for the sake of conservativeness.
		N ₂ O	Yes	Important source of emissions

B.3. Establishment and description of baseline scenario

As per AMS-II.G, version 10, 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.

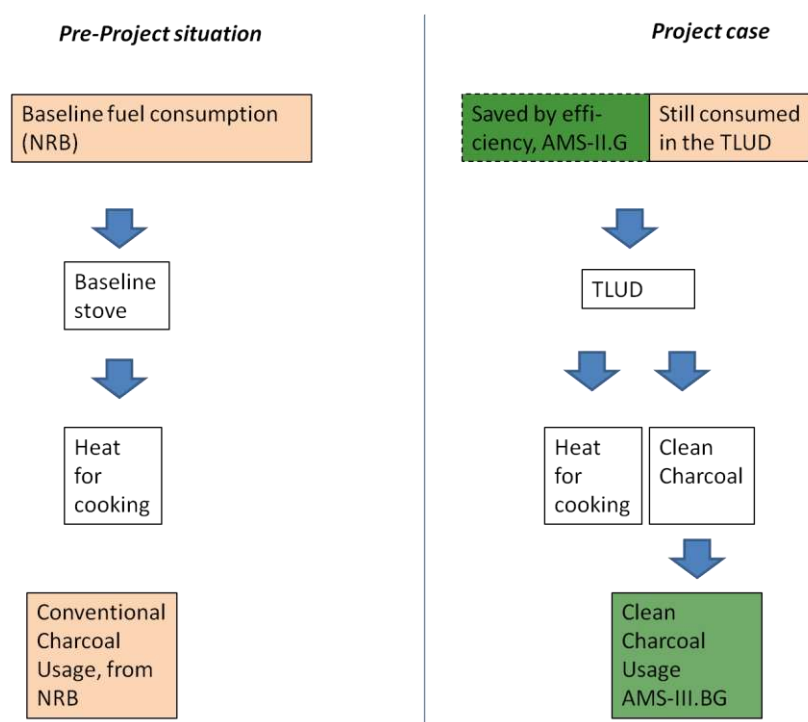
Regarding the charcoal generation component (AMS-III.BG), the project aims at replacing conventional charcoal used by different consumers eligible under AMS-III.BG such as barbecue restaurants. Such users traditionally use conventional charcoal produced from unsustainably harvested fuelwood. A default 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.4. Estimation of emission reductions**B.4.1. Explanation of methodological choices**

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.

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. 17:

(equation 2)

$$ER_{II.G,y} = \sum_i \sum_j ER_{II.G,y,i,j} - LE_y$$

Where:

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

and

equation (3)

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

Where:

$B_{y,savings,i,j}$	=	Quantity of woody biomass that is saved in tonnes per cook stove device of type i and batch j during year y
$f_{NRB,y}$	=	Fraction of woody biomass that can be established as non-renewable biomass using survey methods or government data or default country specific fraction of non-renewable woody biomass (f_{NRB}) values available on the CDM website.
$NCV_{biomass}$	=	Net calorific value of the non-renewable woody biomass that is substituted (IPCC default for wood fuel, 0.0156 TJ/tonne, based on the gross weight of the wood that is 'air-dried')
$EF_{projected_fossilfuel}$	=	Emission factor for the fossil fuels projected to be used for substitution of non-renewable woody biomass by similar consumers. Use a value of 63.7 t CO ₂ /TJ
$N_{y,i,j}$	=	Number of project devices of type i and batch j operating during year y ,
$\mu_{y,i,j}$	=	Adjustment to account for any continued use of pre-project devices during the year y . Set to one according to AMS-II.G par 17.
LE_y	=	Leakage emissions in the year y

$N_{y,i,j}$ 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 7 of AMS-II.G vers. 9 is used.

$B_{y,savings,i,j}$ 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 22, WBT) is chosen, with the corresponding formula (equation 7 of AMS-II.G version 9):

(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:

Where:

$B_{y=1,new,i,survey}$	=	Quantity of woody biomass used by project devices in tonnes per device of type i .
$\eta_{old,i,j}$	=	Efficiency of the old devices being replaced by project devices of type i and batch j .
$\eta_{new,i,j}$	=	Efficiency of the project device i and batch j . 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)**

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

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 areas⁴

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	Unit	Tropical					Subtropical
		Rain Forest	Moist	Dry	Shrub	Mountain	Mountain
F _{forest,i} : ⁴	%	13%	11%	56%	9%	7%	5%
MA _{forest,i} : ⁵	(t/ha/yr)	4.6	5.5	3.8	3.2	1.9	1.9
MA _{forest,i} * (F _{forest,i} - P _{forest}): ⁶	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

⁴ FAO 2000:Table 14. Distribution of total forest area by ecological zone - India (%); <http://www.fao.org/3/y1997e/y1997e21.htm>

⁵ 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

⁶ 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>

According to AMS-II.G para. 29 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)

$$ER_{III.BG,y} = \sum_i Q_{CCP,i,y} \times \left[\left(CF \times NCV_{wood} \times \frac{NCV_{charcoal}}{NCV_{charcoal,default}} \times f_{NRB,BL,wood} \times EF_{projected_fossilfuel} \right) + (SMG_{y,b} - M_d) \times (1 - f_{NRB,BL,wood}) \times GWP_{CH_4,y} \right] - PE_{y,fugitive} - PE_{y,flaring} - PE_{FF,y} - PE_{EL,y} - PE_{BC,y}$$

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)

$$ER_y = \sum_i Q_{CCP,iy} \times \left[\left(CF \times NCV_{wood} \times \frac{NCV_{charcoal}}{NCV_{charcoal,default}} \times f_{NRB,BL,wood} \times EF_{projected_fossilfuel} \right) + SMG_{y,b} \times (0.9 - f_{NRB,BL,wood}) \times GWP_{CH_4,y} \right]$$

$f_{NRB,y}$ 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.4.2. Data and parameters fixed ex ante

(Copy this table for each piece of data or parameter.)

Data/Parameter	<i>NCV_{wood}</i> or <i>NCV_{biomass}</i>
Data unit	TJ/tonne
Description	Net calorific value of the non-renewable woody biomass that is substituted
Source of data	AMS-II.G, version 10, 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 10, para. 17.
Purpose of data	Calculation of baseline emissions
Additional comment	

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

Data/Parameter	<i>f_{NRB,y}</i>
Data 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.4.1
Purpose of data	Calculation of baseline emissions
Additional comment	

Data/Parameter	<i>EF_{projected_fossilfuel}</i>
Data 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 10, default value under para. 17.
Value(s) applied	63.7
Choice of data or Measurement methods and procedures	Default value as provided by AMS II.G version 10, par.17
Purpose of data	Calculation of baseline emissions
Additional comment	

Data/Parameter	$NCV_{charcoal}$
Data unit	GJ/ton
Description	Net calorific value of charcoal type i generated in ICSs in the project activity
Source of data	AMS–III.BG
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	L_y
Data 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 10, para 29, $B_{y,i,j,savings}$ 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
Data unit	-
Description	Conversion factor fuelwood to conventional charcoal
Source of data	AMS–III.BG, version 3
Value(s) applied	6
Choice of data or Measurement methods and procedures	Default value given in AMS–III.BG, version 3
Purpose of data	Calculation of baseline emissions
Additional comment	

Data/Parameter	GWP_{CH4}
Data 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	$SMG_{y,b}$
Data 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	M_d
Data 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	
Additional comment	

B.4.3. Ex ante calculation of emission reductions

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)

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

The only parameters that are not determined ex-ante are $\eta_{new,j}$ and $N_{y,j}$, which are monitored or calculated from monitored parameters (see B.7.1).

$\left(\frac{\eta_{new,j}}{\eta_{old,j}} - 1 \right)$ is preliminarily set to 1 for the ex-ante calculation of emission reductions, assuming an ICS efficiency of 20% without considering charcoal ($0.20/0.10 - 1 = 1$, see B.5.1).

No drop-out is assumed for preliminary calculations.

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

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

$Q_{CCP,i,y}$ will be monitored, it is preliminarily set to 350kg (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	$B_{y=1,new,i,survey}$	Fixed	tons/a	1.69
B	$\eta_{new,i,j}$ (efficiency of the device of each type i and batch j implemented as part of the project activity from a WBT without considering remaining charcoal)	Monitored	%	28.00%
C	η_{old} (efficiency of replaced stove)	AMS-II.G default	%	10.00%
D	L_y : Discount for leakage	AMS-II.G default		0.95
E	$B_{y,savings,i,j}$ per stove	$A * ((B/C) - 1) * D$	tons/a	2.89
F	f_{NRB} : fraction of non-renewable biomass	NRB/(NRB+DRB), value for West Bengal	%	87.18%
G	$EF_{projected_fossilfuel}$	AMS-II.G default	tCO2/TJ	63.71
H	$NCV_{biomass\ or\ wood}$	AMS-II.G default	TJ/t	0.0156
ER _{II.G} per ICS		$E * F * G * H$	tons/a	2.50
J	$Q_{CCP,i,y}$: Quantity of charcoal produced and used	Monitored, preliminary value 20% of $B_{y=1,new,i,survey}$ per stove	tons	0.34
K	CF: Conversion factor wood to charcoal	AMS-II.G defaults, IPCC guidelines		6
L	$NCV_{charcoal} / NCV_{charcoal,default}$	Fixed: 29.58/29.5		1.00
M	$SMG_{y,b}$	Default given in AMS-III.BG.		0.03
N	GWP_{CH4}	Default IPCC value		25
Expected ER _{III.BG} per ICS for use of charcoal replacing charcoal		$J * ((K * L * G * H) + (M * (0.9 - G) * N))$	tCO2/a	1.77

ER for a population of ICS will be calculated considering $N_{y,j}$ and $DO_{II,G,y}$.

Expected emission reductions are derived based on the estimated numbers of ICS planned to be distributed in the CPA.

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

Year	Estimation of project activity emissions (tCO ₂ e)*	Estimation of baseline emissions (tCO ₂ e)	Estimation of leakage (tCO ₂ e)**	Estimation of overall emission reductions (tCO ₂ e)
01/03/2020	0	253,699	N/A	253,699
2021	0	417,267	N/A	417,267
2022	0	524,454	N/A	524,454
2023	0	626,282	N/A	626,282
2024	0	723,018	N/A	723,018
2025	0	814,918	N/A	814,918
2026	0	774,172	N/A	774,172
28/02/2027	0	122,577	N/A	122,577
Total (t CO₂ e)	0	4,256,387	N/A	4,256,387
Total number of crediting years	7			
Annual average over the crediting period		608,055		608,055

The emission reduction calculations in this CPA DD are carried out with a preliminary assumption that no new stoves will be distributed after 2021, however more stoves may be included under the CPA after 2021.

B.5. Monitoring plan

B.5.1. Data and parameters to be monitored

(Copy this table for each piece of data or parameter.)

Data / Parameter:	$B_{y=1,new,survey}$
Data 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	$B_{y=1,new,survey} = fillings_{y=1} * load_{y=1} * 0.052$ (conversion factor to from kg /week to t/a) $fillings_{y=1}$: Average number of weekly fillings of a batch-loaded ICS $fillings_{y=1}$: 29.89

	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. Survey done during the last monitoring of the GS 1296 project (MP6). https://impact.sustain-cert.com/public_projects/181 $load_{y=1}$: Average amount of fuelwood used per filling of an ICS $load_{y=1}$: 1.087 kg The average weight of a ICS fuelwood load was determined as the average value obtained over all WBTs that are conducted to determine $\eta_{new,j}$. $B_{y=1,new,survey} = fillings_{y=1} * load_{y=1} * 0.052$ $B_{y=1,new,survey} = 29.89 * 1.087kg * 0.052 = 1.69$
Monitoring frequency	Annually
QA/QC procedures	-
Purpose of data	Calculation of baseline emissions
Additional comment	

Data/Parameter	η_{old}
Data unit	%
Description	Efficiency of the baseline system being replaced
Source of data	AMS-II.G, version 10, default value
Value(s) applied	0.10
Measurement methods and procedures	According to AMS II.G, ver. 10, Table 17, 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:	$\eta_{new,j}$
Data Unit:	%
Description:	Efficiency of the device of each type <i>i</i> and batch <i>j</i> 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. Efficiency losses will be monitored according to AMS-II.G version 10 para 32
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. 10, 32 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 32 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 vers. 09.0.
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.

Data / Parameter:	$N_{y,j}$
Data Unit:	Number
Description:	Adjusted total number of ICS of batch j operating during year y..
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 new stoves commissioned each 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, $N_{y,j}$ will include an adjustment factor by applying the following formula: $N_{y,j} = N_{soldtotal,y,j} * d_{average,y} / mlength_y$ Where: $N_{soldtotal,y,j}$ total number of ICS of batch j 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 $mlength_y$ length of period y No adjustment will apply to the number of ICS sold before the current monitoring period.
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:	$DO_{II,G,y}$
Data Unit:	%
Description:	Statistically adjusted drop out from total population of ICS in period y
Source of data:	Primary data collection: dedicated monitoring team; database maintenance: CME and/or PP
Value(s) applied:	Preliminary value: 5% (based on experiences of a pilot project)
Measurement methods and procedures:	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 according to the sampling procedure described in section B.5.2. 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:	It will be assured that all requirements of the sampling plan of the CPA are met.
Purpose of data:	Calculation of baseline emissions
Additional comment:	

Data / Parameter:	$Q_{CCP,i,y}$
Data 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: 20% of the amount of fuelwood consumed in micro gasifier stoves

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 CPA 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: $Q_{CCP,i,y} = \text{weightbags}_{y,i} * nbags_{y,i}$ Where: $\text{weightbags}_{y,i}$ 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. $\text{weightbags}_{y,i}$ 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:	continuously at the time of delivery 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	$t_{y,i,j}$
Data unit	Number of hours
Description	Number of hours of utilization of the device during the year y
Source of data	Monitored
Value(s) applied	Preliminary value 5454.9 hours (4.27 usage per day, 7 days a week and ca. 0.5 hours per usage based on last monitoring results of our GS 1296 project)
Measurement methods and procedures	The number of hours of utilization will be determined by sampling, through interviews where it will be checked how often the device is used per day and week. The rated capacity will be based on the manufacturer specification. The number of utilization hours shall be estimated at least once every two years (annually or biennially). The biennial survey shall follow a 95 per cent confidence interval and a 10 per cent margin of error in accordance with the "Standard for sampling and surveys for CDM project activities and programme of activities"

Monitoring frequency	Yearly
QA/QC procedures	Data will be collected using the standard procedures and will be stored for the crediting period and an additional two years.
Purpose of data	Emission reduction calculation
Additional comment	-

Data/Parameter	Life Span
Data 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 Error! Reference source not found.
Source of data	Manufacturer (certified by a national standards body or an appropriate certifying agent recognized by that body)
Value(s) applied	
Measurement methods and procedures	
Monitoring frequency	Fixed and recorded at the time of commissioning
QA/QC procedures	
Purpose of data	
Additional comment	

Data/Parameter	Date of commissioning of batch j
Data 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	Date of commissioning of project device i
Data 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	$N_{d,HH}$
Data 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

B.5.2. Sampling plan

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 monitored directly, as described in B.5.1, thus no sampling is necessary: $N_{y,i,j}$ and $Q_{CCP,i,y}$ (where possible). Where $Q_{CCP,i,y}$ 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:

- $DO_{II.G,y}$

Mean parameters:

- $\eta_{new,i,j}$
- **weightbags**_{y,i} (where applicable, used to determine $Q_{CCP,i,y}$)

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

$DO_{II.G,y}$, $\eta_{new,i,j}$ 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 $DO_{II.G,y}$, $\eta_{new,i,j}$.

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. 36.

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 this CPA-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. 41, "when biennial inspection is chosen a 95% confidence interval and a 10% margin of error requirement shall be achieved for the sampling parameter. On the other hand when the project proponent chooses to inspect annually, a 90%

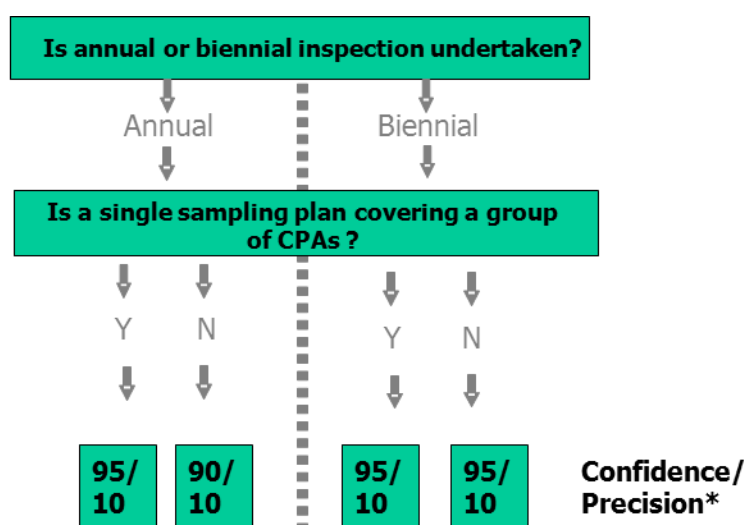
confidence interval and a 10% margin of error requirement shall be achieved for the sampled parameters. In cases where survey results indicate that 90/10 precision or 95/10 precision is not achieved, the lower bound of a 90% or 95% confidence interval of the parameter value may be chosen as an alternative to repeating the survey efforts to achieve the 90/10 or 95/10 precision”.

Additional requirement for PoAs as per sampling standard:

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.

v. Confidence/precision criteria to be met

As mentioned above, according to AMS-II.G ver. 9, par. 36, confidence/precision criteria to be met is determined as follows:



*due to methodology precedence

Note: As per par. 41 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 $DO_{II,G,y}$, $\eta_{new,i,j}$ 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 $Q_{CCP,i,y}$, 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 CPAs. 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 and a sample may be drawn across CPAs. The largest number for the sample size will be chosen for the sampling effort with one common survey for **DO_{ll,G,y}**. 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}**, 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}**, 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 CPA-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
DO_{ll,G,y}	XXX	XXX	XXX	XXX

$\eta_{new,i,j}$	XXX	XXX	XXX	XXX
$weightbags_{y,i}$	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: $DO_{ll,G,y}$

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

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 $\eta_{new,i,j}$

($weightbags_{y,i}$ see cluster sampling)

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

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
$DO_{ll,G,y}$	Biennial and/or across CPA	95/10	XXX	XXX	XXX	XXX
$\eta_{new,i,j}$			XXX	XXX	XXX	XXX
$DO_{ll,G,y}$	one CPA, annual	90/10	XXX	XXX	XXX	XXX
$\eta_{new,i,j}$			XXX	XXX	XXX	XXX

The largest number for the sample size, in this case the sample size calculated for $DO_{ll.G,y}$, will be chosen for the sampling effort with one common survey for all parameters. For the monitoring of all other parameters, a random sub-sample 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, **weightbags_{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 mean	Expected Standard deviation	Estimated number of clusters	Applied number of clusters
weightbags_{y,i}	Biennial and/or across CPA	95/10	xxx	xxx	xxx	xxx
weightbags_{y,i}	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 CPA. Sampling across several CPAs is also possible when the same ICS type is deployed under these CPAs. 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 confidence interval)
- z

The framework for calculation of c for the parameter **DO_{ll,g,y}** 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	pA	a
B	N _B	pB	b
C	N _C	pC	c
D	N _D	pD	d

E	N _E	pE	e
F	N _F	pF	f
G	N _G	pG	g
$\bar{N}^*$	(N _A + N _B + N _C + N _D +...)/M		
		(pA+pB+pC+pD+...)/ 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 sizes 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 determined 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 ***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 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 of (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 ***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
$DO_{ll,g,y}$	$DO_{ll,g,y}$	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
$Q_{CCP,i,y}$	$weightbags_{y,i}$	Average filling of a standardised charcoal bag
	$nbags_{y,i}$	Number of bags, not sampled, taken from receipts/invoices of charcoal sales

ii. Determination of appropriate timing

In general (under normal circumstances), measurements will be conducted at the latest 6 months after the end of the specific monitoring period.

Therefore:

In general (under normal circumstances), the measurement will be conducted at the latest 12 + 6 months after the start of the specific monitoring period (annual monitoring) or at the latest 24 + 6 months after the start of the specific monitoring period if biennial inspection is chosen.

iii. Frequency of measurements

All measurements will be one time measurements, i.e. for the determined number of samples the measurement will only be conducted once per sample. However, this does not imply that every household can only be contacted once (see below).

iv. Demonstration that parameter of interest is not subject to seasonal fluctuations if measurements are conducted only during limited time periods or demonstrate that selected time period is conservative or corrections are applied

$DO_{ll,g,y}$: Drop outs are recorded when users are found to not use the stove any longer. These parameters are determined by asking the user a yes-or-no question at the end of the monitoring period. If an ICS is no longer in use, it will be accounted as not in use over the entire period. Due to this conservative approach, seasonal effects will have no impact on the final result.

$\eta_{new,i,j}$: No seasonal changes of stoves efficiency are expected.

$weightbags_{y,i}$: Seasonal fluctuations are excluded since only dry charcoal will be accepted by charcoal buyers; moreover, buyers will check the correct weight of bags since they have a commercial interest in not paying for smaller amounts than invoiced.

v. Description of measurement methods

$DO_{ll,g,y}$: Drop outs will be either determined through monitoring recording sheets by the users themselves or through interviews where it will be checked if the appliances are still operational. Interviews will be reported in a questionnaire.

$\eta_{new,i,j}$ is determined applying the WBT protocol (see B.4, and B.7.1). Tests will be reported in spreadsheet templates. All equipment used will fulfill the requirements of CDM-EB65-A05-STANver09.0 par 114.

$weightbags_{y,i}$ is determined by weighing each bag of a selected cluster on a calibrated electronic scale.

b. Quality Assurance/ Quality Control

i. Procedures for conducting the data collection and/or field measurements

Data collected and processed by the field staff will be checked regularly by the CME or a person dedicated by the CME.

Training of field personnel

All personnel involved in the monitoring will be trained to ensure that each of them undertakes an appropriate monitoring assignment according to the Monitoring Plan. Any personnel involved in the monitoring will be trained by the CME or by or a person dedicated by the CME before performing any monitoring activities. Only people who are trained are qualified to be involved in the monitoring.

Provisions for maximizing response rates

Documentation of out-of-population cases, refusals, other sources of non-responses

- Refusals and non-respondents in case of ICS-related parameters, (i.e. households where the contact could not be established) will be recorded by the monitoring team as well as the reason for the refusal. In case a household or institution refuses to participate in the monitoring effort, the monitoring team will record the reason for the refusal and decide whether or not the refusal is due to a likely non-use of the ICS. If the CME decides that the refusal is due to a likely non-use of the stove, this stove will count as Drop-Out. If the reason is e.g. a time constraint that cannot be solved by repeating the survey effort at this end user at another date, the household or institution will be replaced by another.
- In the case of sampling to determine **weightbags_{y,i}**, field assistants collecting charcoal, who will represent clusters to be sampled, will have a strong interest in cooperating with sampling of charcoal bags since the project offers them support in numerous ways. If due to reasons such as force majeure, a cluster cannot be sampled, another cluster will be selected randomly instead.

ii. Procedure for defining outliers and under what circumstances outlier data/measurements may be excluded and/or replaced

The “3 sigma rule” will be applied: All values outside 3 standard deviations from the mean will be excluded. See also: http://en.wikipedia.org/wiki/68-95-99.7_rule

Other appropriate measures to define and exclude outliers may also be used.

c. Analysis: Describe how the data will be used

Data will be used to calculate emission reductions achieved during the specific monitoring period according to the equations provided in Section B.6.1 of the CPA-DD. The CME and/or PP is responsible for preparing the Monitoring Report.

3. Implementation Plan

a. Schedule for implementing the sampling effort

As mentioned above, under normal circumstances, the schedule for implementing the sampling effort shall be: within 6 months after the end of the specific monitoring period the sampling effort can be finalized.

- b. Skills and resources required for data collection and the analyses, general description of qualifications and experience

The CME will assign the people, entities or qualified third parties responsible for the data collection and analysis. The CME will ensure that the qualification and experience of the person or entity involved is adequate for the specific tasks to be performed by the person or entity.

Other sampling methods which may be more practical and cost effective may alternatively be used, while considering the most recent standard and best practice examples for sampling and surveys for small-scale CDM project activities. If this is the case, the DOE will have to verify at verification stage that the sampling method was statistically sound and as robust as the approaches presented in this CPA-DD.

B.5.3. 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.

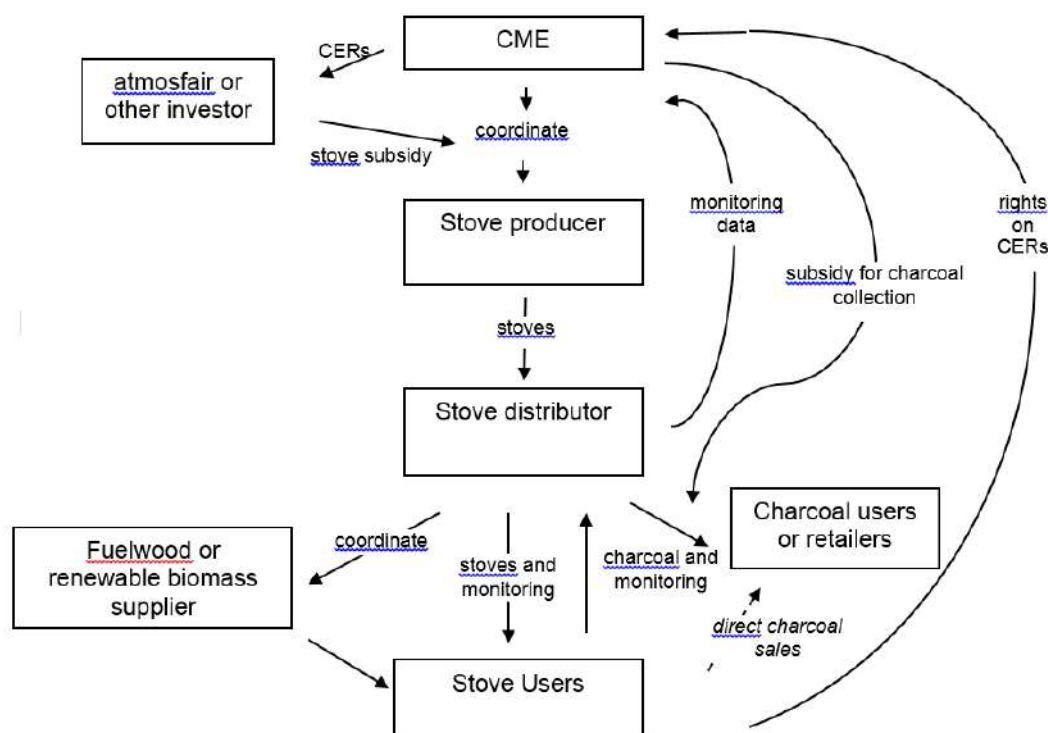


Figure 2: Management System of the PoA

b) 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 CPA 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.

c) 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 CPA implementers involved in the monitoring. Training is needed to ensure that monitoring activities are conducted as per requirements.

SECTION C. Start date, crediting period type and duration

C.1. Start date of CPA

The starting date is 10/09/2018, with the sale/commissioning of the first ICS.

C.2. Expected operational lifetime of CPA

7 years

C.3. Crediting period of CPA

C.3.1. Type of crediting period

A renewable crediting period is chosen

C.3.2. Start date of crediting period

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

C.3.3. Duration of crediting period

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

SECTION D. Environmental impacts

D.1. Analysis of environmental impacts

The analysis of environmental impacts was carried out on PoA level.

D.2. Environmental impact assessment

In accordance with Federal Republic of India regulations, an EIA is not required for the distribution and implementation of TLUD; this technology is not included in the relevant Notification of the MINISTRY OF ENVIRONMENT AND FORESTS, New Delhi 14/09/2006, (Published in the Gazette of India, Extraordinary, Part-II, and Section 3, Sub-section (ii) (document provided to the DOE).

SECTION E. Local stakeholder consultation

E.1. Modalities for local stakeholder consultation

a) Scope of local stakeholder consultation

The Local stakeholder consultation was carried out for a group of CPAs. It shall be valid for all CPAs which are all located in West Bengal and will use 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 stakeholder consultation will however be repeated at CPA level as soon as:

- A CPA is included with a boundary reaching outside West Bengal
- A CPAs is included applying another stove technology than TLUD technology

b) Groups of stakeholders involved

The following groups of stakeholders were invited:

1. Local people directly or indirectly affected by the project and their representatives.
2. Other affected stakeholders not local to the project, for example, national acting NGOs.
3. Small and medium enterprises who are potential charcoal buyers.
4. Local policy makers and representatives of local authorities.
5. Regional authorities such as Religious Heads.
6. National government officials or National Focal Point.
7. Local non-governmental organisations (NGOs) working on topics relevant to your project.
8. A Gold Standard representative at help@goldstandard.org
9. International NGOs located in the host country of the project.

c) Means of Invitation

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Invitations were mainly distributed per invitation e-mail which is the common way of informing about meetings in India. Self Help Groups and stove users who might not have access to e-mail have been invited by letter or phone calls. Gold Standard local experts and supporter NGOs were invited through E-mail according to GS's requirement. Additionally the meeting was announced by hanging posters on public sites and by car announcement by Sapient driving around and announcing the meeting. Through such public announcements a broad range of stakeholders could be reached, regardless of gender age and ethnicity or level of education.

d) Information made available to stakeholders

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Along with the invitation the following information was made available:

- Name and non technical summary of the Project
- Place and time of the meeting
- Information on the technology to be used
- Planned organisational structure of the project
- Information on eligibility criteria and process to include CPAs
- Contact details for further questions

All information was also made available on the atmosfair homepage under the following link:
<https://www.atmosfair.de/de/klimaschutzprojekte/energieeffizienz/indien/>

e) The conduct of consultation

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The meeting took place on 12th August 2018 at 10:00 am at

C/o Ananda Sing
 Village: Bahirtafa
 Post Office: Jadurberia
 Police Station: Uluberia
 Howrah, West Bengal, India
 Pin Code: 711316

The following agenda was discussed:

Agenda	PresentedBy
Opening of the meeting	Sapient
Explanation of the Project and presentation of Key Project Information	Sapient
Explanation of Fuelwood Situation	Sapient
Stove Demonstration	Sapient
Lunch	All participants
Questions and clarifications about the project	All participants
Joint Sustainable Development Exercise	All participants
Discussion on monitoring sustainable development	All participants
Discusson on Safeguarding Principles	All participants
Continuous input/grievance mechanism	All participants
Open session for questions and comments	All participants
Closure and evaluation of the meeting	All participants

E.2. Summary of comments received

Participants commented and asked questions about several features of the TLUD which was presented as ICS to be used in the first CPA, such as asking for price and life time of the stove and suggesting regular maintenance. It was also asked what fuel can be used in the stoves and about charcoal generation and charcoal use. Moreover, participants asked what impacts the PoA would have on the local level, particularly regarding job creation and job opportunities for women. They wanted to know when the stoves will be available and how many stoves are planned to be distributed.

Apart from these direct questions, participants evaluated possible social and environmental impacts of the PoA. In general stakeholders were very positive about the project and the meeting. One of the most often asked questions was when the stove will be available in the region. Another concern of the stakeholders was on the future timeline of stove production and stove distribution. They raised concerns about stability of work during the entire project lifetime, because there might be slowdowns in the stove production and stove distribution. Other concerns raised were about the small size of the wood needed to fill the batch filled stove and about the price of the charcoal purchased from the stove users.

E.3. Consideration of comments received

All questions asked were answered by the CME and the project participants and no change of the PoA design is required. Special emphasis will however be put on the stove production and distribution planning. The project partner made clear that the project depends on funding through carbon finance, but that the project partners will do all their best to avoid stoppages and slow downs in the stove production through careful project planning

SECTION F. Eligibility for inclusion

No.	Eligibility criterion - Category	Eligibility criterion - Required condition	Supporting evidence for inclusion
1	Project Standard: EB 93-A07-STAN, Par.120 (a): The geographical boundary of the CPA including any time-induced boundary consistent with the geographical boundary set in the PoA	The PoA boundary corresponds to the boundaries of India. Each CPA will be located within India. Any ICS sold outside India will not be counted as part of the PoA.	Evidence for inclusion: CPA-DD section A.2, specifying location and boundary of the CPA. Additionally, a statement from CPA operator/CME that the boundary is within India.
2	Project Standard: EB 93-A07-STAN, Par.120 (b): Conditions that avoid double counting of emission reductions like unique identification of product and end-user locations	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 section B5.2, describing the unique ICS numbering system for the CPA.
3	Project Standard: EB 93-A07-STAN, Par.120 (c): Conditions to confirm that CPAs are neither registered as CDM Project activities, included in other PoAs nor the project activities that have been deregistered	No CPA will be registered as CDM Project activities, included in other PoAs nor be a deregistered project activity.	Evidence for inclusion: CPA DD section A.7
4	Project Standard: EB 93-A07-STAN, Par.120 (d): The specifications of technology/measure including the level and type of service, performance specifications including compliance with testing/certifications	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: CPA-DD section A.3, specifying on type(s) and efficiency measurement(s) the of ICS used, including, among others, a description whether ICS are fixed or portable and a specification of the capacity and approximated dimensions. Moreover, there shall be a description of the targeted group of ICS users and charcoal users.
5	Project Standard: EB 93-A07-STAN, Par.120 (e): Conditions to check the start date of the CPA 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: CPA-DD section C.1, specifying the CPA start date. Moreover, evidence on the CPA start date will be provided to the DOE.

6	Project Standard: EB 93-A07-STAN, Par.120 (f): Conditions that ensure compliance with other requirements of single or multiple methodologies applied by CPAs	For all CPAs that will be included in this PoA, the use of multiple methodologies (AMS-II.G version 10 and AMS-III.BG. version 03 shall be justified.	Document: CPA-DD, section B.1. Evidence for the applicability of specific methodologies described below.
		Applicability of AMS-II.G: A CPA shall consist in the distribution of ICSs with efficiency improvements in thermal applications of non-renewable biomass. ICS shall have a thermal efficiency of at least 20%.	Evidence for inclusion: CPA-DD section A.3, specifying on type(s) and efficiency measurement(s) of ICS used and describing targeted group of ICS users.
		Applicability of AMS-III.BG.: Charcoal shall be generated in the CPA micro gasifier stoves at household level and supplied to identified consumers included in the project boundary. Users of charcoal can 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. Measures such as contractual agreements shall be implemented to avoid potential double counting because of potential claims of emission reductions by the end users.	Evidence for inclusion: CPA-DD, specifying on type(s) of ICS used, describing targeted groups of ICS users, charcoal users and samples of agreements signed with charcoal users stating that no ER will be claimed by them for the use of charcoal generated under the CPA.
7	Project Standard: EB 93-A07-STAN, Par.120 (g): The conditions that ensure that the CPA meets the requirements pertaining to the demonstration of 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”	Evidence for inclusion: CPA-DD section A.1, showing that the units applied under the CPA are all below the microscale thresholds for the corresponding project Type.
8	Project Standard: EB 93-A07-STAN, Par.120 (h): Conditions to ensure the compliance with other requirements of the applied methodology	n.a	n.a

9	Project Standard: EB 93-A07-STAN, Par.120 (i): The PoA-specific requirements, including any conditions related to undertaking local stakeholder consultation and environmental impact analysis	The local stakeholder consultation will be conducted at the CPA level for a group of CPAs to be implemented within the same geographical boundaries (e.g. states) and using the same stove technology. Each CPA will be implemented in similar social economic situations. The key stakeholders of the program both at PoA and CPA level are the same. However, the stakeholder consultation will be repeated at CPA level as soon as: - A CPA is included in a new region inside the geographical boundary of the PoA, or - A CPAs is included applying another stove technology than the TLUD gasifier stove technology An environmental impact analysis is not required (section E.2 of the PoA-DD).	Evidence for inclusion: Check of documentation of CPA-DD sections regarding geographical boundary and description of stove technology. The stakeholder consultation will be repeated on CPA level as soon as: - A CPA is included in a new region inside the geographical boundary of the PoA, or - A CPAs is included applying another stove technology than the TLUD gasifier stove technology
10	Project Standard: EB 93-A07-STAN, Par.120 (j): Conditions to provide an affirmation that funding from Annex I Parties, if any, does not result in a 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: CPA DD Section A.6.
11	Project Standard: EB 93-A07-STAN, Par.120 (k): Where applicable, target group (e.g. domestic/commercial/industrial, rural/urban, grid-connected/off-grid) and 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 section A.3, describing the target groups. 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.
12	Project Standard: EB 93-A07-STAN, Par.120 (l): Where applicable, the conditions related to sampling requirements for the PoA in accordance with the "Standard for sampling and surveys for CDM project activities and programme of activities"	Monitoring of all CPAs will adhere to all requirements related to sampling for a PoA in accordance with the sampling standard CDM-EB50-A30-STAN vers.7.	Evidence for inclusion: CPA-DD section B.5.2, describing the sampling plan In case the CPA is not implemented by the CME and/or PP itself, an agreement will be signed with the CME defining responsibilities and duties of the implementing agent.

13	Compliance with microscale CDM units of energy efficiency units: AMS-II.G. ver. 10 paragraph 46, and Microscale additionality tool, version 9.0 paragraphs 12(a) and 12 (b)(i) along with footnote 15	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: Footnote 15: Further conditions to check the penetration rate as specified in appendix of this document applies.	Evidence for inclusion: CPA-DD section A1 shows that the units distributed under the CPA qualify as microscale units by showing that they qualify as 12(b)(i): High efficiency biomass fired devices (e.g. energy efficient cookstoves) and by showing that energy savings of the units are below the microscale threshold. Furthermore, in the CPA DD, it is demonstrated that the penetration rate of the proposed technology is 0.77% and such less than 5% of the technologies/measures (providing similar services) in the region as per CDM TOOL19 vers 9.0, appendix. Based on the report "Access to Clean Cooking Energy and Electricity" from 2018.
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Appendix 1. Contact information of CPA implementers

Organization name	Nature Club of Rajasthan
Country	India
Address	A-4, Kirti Nagar, Vasundhara Colony, Gopal Pura Mode, Jaipur, Rajasthan 302018, India
Telephone	M:+91 9414092888
Fax	
E-mail	hitesh19gg@yahoo.com
Website	http://www.natureclubrajasthan.org
Contact person	Mr Hitesh Goyal

Organization name	atmosfair gGmbH
Country	Germany
Address	Zossener Strasse 55-58, 10961Berlin
Telephone	+49 30 120 8480-0
Fax	+49 30 627 3550-29
E-mail	info@atmosfair.de
Website	www.atmosfair.org
Contact person	Dr. Katrin Mikolajewski

Appendix 2. Affirmation regarding public

ODA Declaration

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

ER calculation spreadsheet in a separate file

Appendix 4. Further background information on monitoring plan

Calculation of sample size

Appendix 5. Summary report of comments received from local stakeholders

LSC Report

Appendix 6. Summary of post-registration changes

NA

Document information

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

<i>Version</i>	<i>Date</i>	<i>Description</i>
02.0	13 March 2012	Revision required to ensure consistency with the "Guidelines for completing the component project activity design document form" (EB 66, Annex 16).
01.0	27 July 2007	EB 33, Annex 42 Initial adoption.
Decision Class: Regulatory Document Type: Form Business Function: Registration Keywords: component project activity, project design document		