<table>
<tr><td colspan="2" align="center">

Programme design document form for small-scale CDM programmes of activities

(Version 04.0)
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<tr><td colspan="2">Complete this form in accordance with the Attachment "Instructions for filling out the programme design document form for small-scale CDM programmes of activities" at the end of this form.</td></tr>
<tr><td colspan="2" align="center">PROGRAMME DESIGN DOCUMENT (PoA-DD)</td></tr>
<tr><td>Title of the PoA</td><td>Dissemination of improved cook stoves and generation of charcoal</td></tr>
<tr><td>Version number of the PoA-DD</td><td>6</td></tr>
<tr><td>Completion date of the PoA-DD</td><td>24/06/2016</td></tr>
<tr><td>Coordinating/ managing entity</td><td>Servals Automation Private Ltd.</td></tr>
<tr><td>Host Party(ies)</td><td>India</td></tr>
<tr><td>Sectoral scope(s) and selected methodology(ies), and where applicable, selected standardized baseline(s)</td><td>Scopes 1, 3 and 4
AMS-II.G vers.7, AMS–III.BG. vers. 3 and AMS-I.E vers. 6,</td></tr>
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PART I.   Programme of activities (PoA)

SECTION A.   General description of PoA

A.1.   Title of the PoA

\>\>
Dissemination of improved cook stoves and generation of charcoal
Version No: 06
Date: 24/06/2016

A.2.   Purpose and general description of the PoA

\>\>
a) Policy/measure or stated goal that the PoA seeks to promote

The proposed PoA aims at reducing the fuel wood consumption of traditional stove users by disseminating improved cook stoves, mainly micro wood gasifier stoves, at subsidized prices. Moreover the consumption of conventional charcoal by traditional charcoal users shall be reduced by providing them charcoal generated in micro wood gasifier stoves. Additionally, fuel wood consumption shall be reduced even more by providing ICS users with renewable biomass as a fuel.

Overall objectives are reduction of greenhouse gases, conservation of forests and woodlands as well as improved health conditions of ICS users due to improved indoor air quality.

(b) Framework for the implementation of the proposed PoA

The PoA is a voluntary initiative of Servals Automation Pvt. Ltd., who will act as CME. Partners are atmosfair gGmbH, who will provide funding and assist with CDM matters, and Sapient Infotech, who will distribute stoves at the local level. Other partners may be included.

The PoA will facilitate the procurement of ICSs so that the end user can obtain them at subsidized prices. Carbon revenues will be used to fund ICS distribution and to cover monitoring costs. Moreover, the PoA shall facilitate the collection of charcoal generated in ICSs from selected users and the sale of this charcoal to users who would otherwise have used conventional charcoal. Additionally, selected users shall be provided with renewable biomass to run the ICS, allowing for saving even more conventional fuel wood.

Servals Automation Pvt. Ltd. will coordinate CDM-related activities, particularly coordinating the PoA and monitoring. Partners will be in charge of funding and distributing stoves and managing the logistics of charcoal collection and provision of renewable biomass.

c) Confirmation that this PoA is a voluntary action
This PoA is a voluntary action by Servals Automation Pvt. Ltd.

d) Contribution to sustainable development
The PoA 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.

A.3.   CME and participants of PoA

\>\>
Servals Automation Pvt. Ltd., CME

Headquarters& Postal address:	5/1, BalajiNagar 1st Street, Ekkatuthangal, Chennai – 600 032, Tamil Nadu, India
Managing Director :	Sujatha Srinivasan
Represented by:	Sujatha Srinivasan
Tel:	+ 91 4464577181
Email:	sujatha@servals.in

atmosfair gGmbH, project participant

Headquarters:	Kaiserstr. 201, 53113 Bonn, Germany
Postal Address:	Zossener Straße 55-58; 10961 Berlin, Germany
Commercial register:	Bonn HRB 13789
Managing Director:	Dr. Dietrich Brockhagen
Website:	www.atmosfair.org
Represented by:	Dr. Katrin Mikolajewski
Tel:	+49 30 627 3550-16
Email:	mikolajewski@atmosfair.de

A.4. Party(ies)

Name of Party involved (host) indicates host Party	Private and/or public entity(ies) project participants, CME (as applicable)	Indicate if the Party involved wishes to be considered as project participant (Yes/No)
India (host)	Servals Automation Pvt. Ltd. (CME)	No
Germany	atmosfair gGmbH (PP)	No

A.5. Physical/ Geographical boundary of the PoA
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The PoA will be located in India, the boundary of the PoA being identical to the political boundaries of the Republic of India.
Approximated geographical coordinates are 8-36° northern latitude and 68-98° eastern longitude.

CPA boundaries may be the boundaries of all India or of sub-units such as states.

Political map of India

A.6. Technologies/measures

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The PoA is generally open for different technologies that allow energy efficient cooking with biomass.

Figure 1: TLUD micro gasifier stove.

One focus technology consists in micro gasifier stoves like the Servals TLUD Gasifier Cookstove. 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 upwards 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.

A.7 Public funding of PoA

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There is no public funding from Annex I parties for this PoA.

SECTION B.   Demonstration of additionality and development of eligibility criteria

B.1.   Demonstration of additionality for PoA

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The proposed PoA is a voluntary coordinated action by Servals Automation Pvt. Ltd.. There is no mandatory law or requirement in India to foster the dissemination of improved cook stoves and generation of charcoal. Hence this voluntary coordinated action would not be possible in the absence of the PoA, due to the cost associated with it.

Under this PoA, the additionality of the project activity is demonstrated by a barrier analysis that is in line with EB 83, Annex 14, "Demonstration of additionality of small-scale project activities" (version 10) where it says as follows:

*According to para 11 of the "*Demonstration of additionality of small-scale project activities"
Documentation of barriers, as per paragraph 1 above, is not required for the positive list of technologies and project activity types that are defined as automatically additional for project sizes up to and including the small-scale CDM thresholds (e.g. installed capacity up to 15 MW). The positive list comprises of:
[…]

(c) Project activities solely composed of isolated units where the users of the technology/measure are households or communities or Small and Medium Enterprises (SMEs) and where the size of each unit is no larger than 5% of the small-scale CDM thresholds;

As part of the CPA inclusion check, it has to be demonstrated for each CPA that it is exempted from performing the debundling check, since if each of the independent subsystem/measures included in the CPA of a PoA is no larger than 1% of the small scale threshold defined by the methodologies applied (Methodological tool: Assessment of debundling for small-scale project activities, v04, EB 83, Annex 13, par. 14).
Since the criterion for exemption of the debundling check is stricter than the criterion for automatic additionality, additionality is given if the debundling check is passed and does not need to be assessed separately.

B.2. Eligibility criteria for inclusion of a CPA in the PoA
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The eligibility criteria for inclusion of a CPA in the PoA has been developed as per the EB 87, Annex 03. According to this the following criteria must fulfilled by each CPA to be included in the PoA. Two sets of eligibility criteria are defined, one for CPAs including all three methodologies and one for CPAs applying only AMS-II.G and AMS-III.BG:

Eligibility criteria (EC) for CPA inclusion case 1, CPA with three methodologies

Nr	Eligibility Criteria		Mean of proof / Evidence Document (to be checked at CPA inclusion)
	Category	Description	
1	Ref: EB 87, Annex 03 Par.18 (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.7, specifying location and boundary of the CPA. Additionally, a statement from CPA operator/CME that the boundary is within India.

2	Ref: EB 87, Annex 03 Par.18 (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 D.7.2, describing the unique ICS numbering system for the CPA.
3	Ref: EB 87, Annex 03 Par.18 (c): 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.5, 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.
4	Ref: EB 87, Annex 03 Par.18 (d): 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 23/05/2014.	Evidence for inclusion: CPA-DD section A.8.1, specifying the CPA start date. Moreover, evidence on the CPA start date will be provided to the DOE.
5	Ref: EB 87, Annex 03 Par.18 (e): Conditions that ensure compliance with applicability and 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 07, AMS–III.BG. version 03 and AMS-I.E, version 06) shall be justified.	Document: CPA-DD, section B.2/D.2. 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.5, 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	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.

		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.	
		Applicability of AMS-I.E: There shall be ICS in the CPA operated with renewable biomass, thus representing a renewable energy technology. Only residual biomass will be considered in the PoA, in line with the definition given in EB 23 annex 18, constituting biomass by-products, residues and waste streams from agriculture, forestry, and related industries. Also leakage will be excluded, according to the Leakage in biomass small-scale project activities methodological tool (EB 83, Annex 15).	Evidence for inclusion: CPA-DD section A.5, specifying on type(s) of ICS used and types of residual biomass used, including a description of the residual biomass in accordance to EB 23 annex 18 and an assessment of the availability of surplus biomass in accordance with the General guidance on leakage in biomass project activities (EB 83, Annex 15).
6	Ref: EB 87, Annex 03 Par.18 (f): The conditions that ensure that the CPA meets the requirements pertaining to the demonstration of additionality	Additionality is demonstrated as described in detail in Section B.1 of the PoA DD, applying paragraph 11. (c) of EB 83, Annex 14; and making reference to the debundling check which applies even stricter criteria.	Evidence for inclusion: CPA-DD section A.12, showing that the CPA passes the debundling check. Moreover, evidence on the energy savings and thermal capacities of ICS types used.

7	Ref: EB 87, Annex 03 Par.18 (g):
	
	The PoA-specific requirements stipulated by the CME including any conditions related to undertaking local stakeholder consultations and environmental impact analysis
		The local stakeholder consultation will be conducted at the PoA level (Section F of the PoA-DD). 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 with a boundary reaching outside West Bengal, or
		  - A CPAs is included applying another stove technology than the Servals TLUD, or
		  - A CPA is implemented by another institution than the CME
		An environmental impact analysis is not required (section E.2 of the PoA-DD).
			Evidence for inclusion:
			Check of documentation of stakeholder consultation, CPA-DD section C, in cases where:
			  - A CPA is included with a boundary reaching outside West Bengal, or
			  - A CPAs is included applying another stove technology than the Servals TLUD, or
			  - A CPA is implemented by another institution than the CME

8	Ref: EB 87, Annex 03 Par.18 (h): Conditions to provide an affirmation that funding from	The CME and the CPA operator (in case of being different from the CME) shall confirm that in case of public funding, there is no	Evidence for inclusion: Statement of CME and the CPA operator (in case of being different from the CME) on use of ODA.

	Annex I Parties, if any, does not result in a diversion of official development assistance	diversion of Official Development Assistance.	In case of ODA involved in funding or pre-funding parts of a CPA, a confirmation that no diversion of ODA occurs will be provided.
9	Ref: EB 87, Annex 03 Par.18 (i): 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 regional partners such as the Sapient Infotech (Sapient).	Evidence for inclusion: CPA-DD section A.5, 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.
10	Ref: EB 87, Annex 03 Par.18 (j): 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 including all annexes and amendments till EB 86 Annex 03.	Evidence for inclusion: CPA-DD section B.7.2/D.7.2, describing the sampling plan. In case the CPA is not implemented by the CME itself, an agreement will be signed with the CME defining responsibilities and duties of the implementing agent.
11	Ref: EB 87, Annex 03 Par.18 (k): Where applicable, the conditions that ensure that every CPA (in aggregate if it comprises of independent sub units) meets the small-scale or microscale threshold and remains within those thresholds throughout the crediting period of the CPA	The CPA will remain under the applicable SSC limits for each component: For AMS-II.G: Threshold of 180 GWh/a thermal energy savings (threshold as per clarification request SSC_233) for all ICS distributed under the CPA. For AMS–III.BG.: Threshold of total ER of 60,000 t CO_2e per year, for the total amount of charcoal provided to charcoal users. For AMS-I.E: Threshold of 45 MW_{therm} accumulated capacity, for all ICS using renewable biomass.	Evidence for inclusion: CPA-DD section B.2/D.2 and the ER calculation spreadsheet in appendix 3, calculating, in relation to the SSC limits - the estimated maximum number of ICS to be distributed - the estimated maximum amount in total of charcoal to be provided to charcoal users and, - the estimated maximum number of ICS using renewable biomass. During verifications the DOE will assess that the small scale limits were not exceeded at any time for any CPA. Additional evidence: Stove producer's specifications on stove capacity.
12	Ref: EB 87, Annex 03 Par.18 (l): Where applicable, the requirements for the debundling check, in case the CPAs belongs to small-scale or microscale project categories.	If each of the independent subsystems/measures included in the CPA of a PoA is no larger than 1% of the small-scale thresholds defined by the methodologies applied, then the is exempted from performing de-bundling check (EB 83, Annex 13). 1% of SSC limits correspond to energy savings of 1.8 GWh, ER of 600t CO_2 annually or an installed capacity of 450 kW_{th}.	Evidence for inclusion: CPA-DD, section A.12, showing that each ICS distributed under the CPA is clearly below 1% of each of the relevant SSC thresholds. Additional evidence: Stove producer's specifications on stove capacity.

13	Approval of CPA by CME	The CME approves each CPA to be included into its registered PoA.	Evidence for inclusion: Statement of CME giving approval for the CPA to be included into its registered PoA.
14	CER ownership	End users receiving ICSs under the specific CPA as well as charcoal users receiving charcoal from the CPA contractually cede their rights to claim and own emission reductions under the Clean Development Mechanism of the UNFCCC to the CME of the PoA.	Evidence for inclusion: A default sales agreement for end users including the provision that emission reductions generated by the stove are owned by the CME will be provided for each CPA.
15	Awareness and agreement of those operating a CPA on PoA subscription	Contractual provisions to ensure that those operating the CPA are aware and have agreed that their activity is being subscribed to the PoA.	Evidence for inclusion, in case CPA operators are different from the CME: A declaration from CPA operators, stating that they are aware and have agreed that their activity is being subscribed to the PoA will be provided for each CPA.

Eligibility criteria (EC) for CPA inclusion case 2, CPA applying AMS-II.G and AMS-III.BG

Nr	Eligibility Criteria		Mean of proof / Evidence Document (to be checked at CPAinclusion)
	Category	Description	
1	Ref: EB 87, Annex 03 Par.18(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.7, specifying location and boundary of the CPA Additionally, a statement from CPA operator/CME that the boundary is within India.
2	Ref: EB 87, Annex 03 Par.18 (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 B/D.7.2, describing the unique ICS numbering system for this CPA.
3	Ref: EB 87, Annex 03 Par.18 (c): 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.	Evidence for inclusion: CPA-DD section A.5, 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.

		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.	
4	Ref: EB 87, Annex 03 Par.18 (d): 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 23/05/2014.	Evidence for inclusion: CPA-DD section A.8.1, specifying the CPA start date. Moreover, evidence on the CPA start date will be provided to the DOE.
5	Ref: EB 87, Annex 03 Par.18 (e): Conditions that ensure compliance with applicability and 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 07 and AMS–III.BG. version 03) shall be justified.	Document: CPA-DD, section B.2/D.2. 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.5, 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.
6	Ref: EB 87, Annex 03 Par.18 (f): The conditions that ensure that the CPA meets the requirements pertaining to the demonstration of additionality	Additionality is demonstrated as described in detail in Section B.1 of the PoA DD, applying paragraph 11. (c) of EB 83, Annex 14; and making reference to the debundling check which applies even stricter criteria.	Evidence for inclusion: CPA-DD section A.12, showing that the CPA passes the debundling check. Moreover, evidence on the energy savings and thermal capacities of ICS types used.
7	Ref: EB 87, Annex 03 Par.18 (g): The PoA-specific requirements stipulated by the	The local stakeholder consultation will be conducted at the PoA level (Section F of the PoA-DD). Each CPA will be implemented in similar social economic situations. The	Evidence for inclusion: Check of documentation of stakeholder consultation, CPA-DD section C, in cases where:

	CME including any conditions related to undertaking local stakeholder consultations and environmental impact analysis	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 with a boundary reaching outside West Bengal, or - A CPAs is included applying another stove technology than the Servals TLUD, or - A CPA is implemented by another institution than the CME An environmental impact analysis is not required (section E.2 of the PoA-DD).	- A CPA is included with a boundary reaching outside West Bengal, or - A CPAs is included applying another stove technology than the Servals TLUD, or - A CPA is implemented by another institution than the CME
8	Ref: EB 87, Annex 03 Par.18 (h): 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 and 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: Statement of CME and the CPA operator (in case of being different from the CME) on use of ODA (appendix 2). In case of ODA involved in funding or pre-funding parts of a CPA, a confirmation that no diversion of ODA occurs will be provided.
9	Ref: EB 87, Annex 03 Par.18 (i): 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 regional partners such as the Sapient Infotech (Sapient).	Evidence for inclusion: CPA-DD section A.5, 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.
10	Ref: EB 87, Annex 03 Par.18 (j): 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 including all annexes and amendments till EB 86Annex 03.	Evidence for inclusion: CPA-DD section B/D.7.2, describing the sampling plan. In case the CPA is not implemented by the CME itself, an agreement will be signed with the CME defining responsibilities and duties of the implementing agent.
11	Ref: EB 87, Annex 03 Par.18 (k): Where applicable, the conditions that ensure that every CPA (in aggregate if it comprises of independent sub units) meets the small-scale or	The CPA will remain under the applicable SSC limits for each component: For AMS-II.G: Threshold of 180 GWh/a thermal energy savings (threshold as per clarification	Evidence for inclusion: CPA-DD section B.2/D.2 and the ER calculation spreadsheet in appendix 3, calculating, in relation to the SSC limits - the estimated maximum number of ICS to be distributed

	microscale threshold and remains within those thresholds throughout the crediting period of the CPA	request SSC_233) for all ICS distributed under the CPA. For AMS–III.BG: Threshold of total ER of 60,000 t CO2e per year, for the total amount of charcoal provided to charcoal users. .	- the estimated maximum amount in total of charcoal to be provided to charcoal users and, During verifications the DOE will assess that the small scale limits were not exceeded at any time for any CPA. Additional evidence: Stove producer's specifications on stove capacity.
12	Ref: EB 87, Annex 03 Par.18 (I): Where applicable, the requirements for the debundling check, in case the CPAs belongs to small-scale or microscale project categories.	If each of the independent subsystems/measures included in the CPA of a PoA is no larger than 1% of the small-scale thresholds defined by the methodologies applied, then the is exempted from performing de-bundling check (EB 83, Annex 13). 1% of SSC limits correspond to energy savings of 1.8 GWh or ER of 600t CO_2 annually.	Evidence for inclusion: CPA-DD, section A.12, showing that each ICS distributed under the CPA is clearly below 1% of each of the relevant SSC thresholds. Additional evidence: Stove producer's specifications on stove capacity.
13	Approval of CPA by CME	The CME approves each CPA to be included into its registered PoA.	Evidence for inclusion: Statement of CME giving approval for the CPA to be included into its registered PoA.
14	CER ownership	End users receiving ICSs under the specific CPA as well as charcoal users receiving charcoal from the CPA contractually cede their rights to claim and own emission reductions under the Clean Development Mechanism of the UNFCCC to the CME of the PoA.	Evidence for inclusion: A default sales agreement for end users including the provision that emission reductions generated by the stove are owned by the CME will be provided for each CPA.
15	Awareness and agreement of those operating a CPA on PoA subscription	Contractual provisions to ensure that those operating the CPA are aware and have agreed that their activity is being subscribed to the PoA.	Evidence for inclusion, in case CPA operators are different from the CME: A declaration from CPA operators, stating that they are aware and have agreed that their activity is being subscribed to the PoA will be provided for each CPA.

B.3.   Application of technologies/measures and methodologies

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The approved SSC baseline and monitoring methodologies applied under the PoA are:

AMS-II.G, version 07, "Energy Efficiency Measures in Thermal Applications of Non-Renewable Biomass", Sectoral Scope 3: Energy Demand

AMS-I.E, version 06, "Switch from non-renewable biomass for thermal applications by the user", Sectoral Scope 1: Energy Industries

Methodology AMS–III.BG., version 03: "Emission reduction through sustainable charcoal production and consumption", Sectoral Scope 4: Manufacturing Industry

These three methodologies are applicable together because "one principle technology is applied consistently in each CPA using multiple combinations of methodologies (EB 87, Annex 03, version 04.0, para 32, (c)); this principal technology consists in ICS. All ICS save fuel wood, there may however be differences in the fuel combusted (it may consist in renewable or non-renewable biomass) and there may be different uses of the charcoal produced within the ICS. The combination of AMS-II.G and AMS–III.BG, moreover, is explicitly mentioned in the latter methodology.

According to EB 87, Annex 03:

29. The CME shall list in the PoA-DD and the generic CPA-DDs various combinations of technologies/measures and/or approved methodologies that will be implemented in the PoA.

There will be two possible combinations of methodologies; reflected in two different generic CPA-DDs:
   a) Combination of all three methodologies
   b) Combination of AMS-II.G and III.BG, for CPAs where no ER will be claimed for the use of renewable biomass as fuel in ICS.

30. The CME shall define the eligibility criteria for CPA inclusion and, where applicable, sampling plans for each of the combinations separately in accordance with the requirements in section 3.2 above as well as any guidelines/standard approved by the Board pertaining to sampling and surveys. If a CPA uses technologies/measures from several methodologies, it shall be in compliance with all the eligibility criteria derived from the requirements of all the methodologies. These eligibility criteria shall be identified in the validated PoA-DD.

Eligibility criteria for CPA inclusion include eligibility criteria for all methodologies applied, i.e., for all three methodologies in one generic CPA-DD and for a combination of AMS-II.G with AMS-III.BG in the other generic CPA-DD.
Sampling criteria according to the sampling standard are defined in all CPAs, covering all parameters of all methodologies applied in these CPAs (either all three or AMS-II.G and III.BG).The Sampling Plan described in section B.7.2 of each generic CPA-DD is in accordance with the sampling standard EB 50 annex 30 STAN version 05.0.

B.4.   Date of completion of application of methodology and standardized baseline and contact information of responsible person(s)/ entity(ies)

>>

Completed for all applied methodologies on 04/02/2016, by atmosfair gGmbH,

Contact person (not CME): Katrin Mikolajewski, mikolajewski@atmosfair.de

SECTION C.   Management system

>>
The CME, will be, inter alia, the actor responsible for

- including CPAs, confirming that all eligibility requirements are met
- channeling funding for stove procurement
- coordinating and managing the implementation of the monitoring plan,
- coordinating with a DOE to verify emissions reductions from CPAs
- selling CERs.

Servals Automation Pvt. Ltd (Servals) will probably be the main producer of ICS and Sapient Infotech (Sapient) will probably be the main distributor of ICS, however the PoA is open for other partners. atmosfair will probably provide funding and receive CERs, and also provide support with CDM matters.

The following diagram represents the currently planned management structure of the PoA applicable for CPA1. This structure may still be amended and adapted for each CPA.
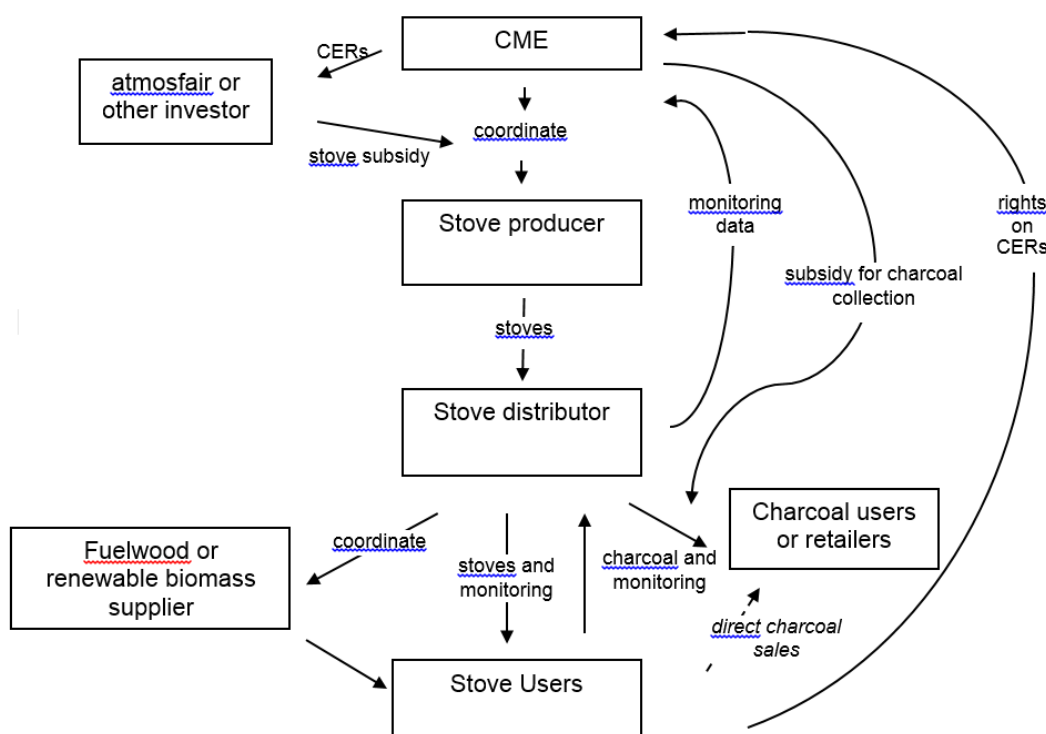

Figure 2: Management System of the PoA

CPA Inclusion Management System

The CME has prepared a CPA Inclusion Management System that satisfies all criteria as outlined in CDM-EB65-A03-STAN ver. 04.0 (EB 87, Annex 03), paragraph 21.

a) Roles and responsibilities

The CME has the competencies to check the features of potential CPAs and ensure that each CPA meets the eligibilities criteria. There will be a person in the CME taking the final decision on CPA inclusions and coordinating monitoring and data management, for example, coordinating the numbering system of ICSs under the different CPAs to avoid double counting.

b) Training and capacity development

The CME coordinates training for all the staff and external CPA implementers. Training is needed to ensure that ICS distribution occurs in accordance to the requirements of the PoA and particularly that monitoring activities are conducted as per requirements.

A training plan has been prepared and is provided to the DOE.

c) Procedure for CPA inclusion

Each CPA to be included into the PoA will be checked by the CME against eligibility criteria. The responsible person at the CME will check the following:

1. Overall general completeness of the CPA documentation (technology, institutions involved, additionality, etc.)

2. Technical review of the proposed CPA, focused on:

- technology and baseline

- integration in centralized monitoring system

- CDM eligibility criteria as specified in the generic CPA-DD section B.5

d) Double counting

In each CPA-DD it will be stated that the CPA has not been and will not be registered neither as a single CDM project activity nor as a CPA under another PoA. The unique numbers allocated to each ICS under the PoA allow unique identification and tracking of the stove. Based on the serial numbers, a stove can only count in one CPA.

e) Records and documentation control process for each CPA under the PoA

The CME 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.

An electronic record keeping system will be operated and maintained for each CPA under the PoA, which contains at least the following information per CPA:

- Name and ID of the CPA
- Date of inclusion of the CPA
- Start of CPA crediting period

- A database including all ICS distributed, specifying
    - Technology deployed (name of the ICS type)
    - Details of the agents/institutions distributing ICS at the local level for the CPA
    - Serial numbers (Stove-ID) and user data of the ICSs belonging to the CPA (please refer to Section B.7.2 of each CPA-DD for details)
- Where applicable, databases will also include information on collection of charcoal from ICS users and sales of charcoal to end users.

- Where applicable, databases will also include information on the provision of ICS users with renewable biomass, including the sources of the renewable biomass.

The record keeping system will be updated as per the progress of the CPA.

Data will be kept for the whole crediting period of the CPA and an additional two years.

f) Continuous improvements of the PoA management system

On an annual basis, the CME will undertake the review of the overall PoA management system, including identifying any problems with CPA inclusion or coordination of ICS distribution or monitoring. This review will take place during the verification and monitoring stage that will help the CME in obtaining an outside perspective of the overall management process.

g) Any other relevant elements

n.a.

SECTION D.   Duration of PoA

D.1.   Start date of PoA

>>
23/05/2014, date when the prior consideration of CDM was published on the UNFCCC website.

D.2.   Duration of the PoA

>>
28 years

SECTION E.   Environmental impacts

E.1.   Level at which environmental analysis is undertaken

>>
Environmental analysis will be undertaken at PoA level since the distribution of ICS will have not have considerable negative environmental impacts; moreover, impacts will be similar in all CPAs.

E.2.   Analysis of the environmental impacts

>>
In accordance with Federal Republic of India regulations, an EIA is not required for the distribution and implementation of ICS; 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 F.   Local stakeholder consultation

F.1.   Solicitation of comments from local stakeholders

>>
A local stakeholder consultation was conducted on 16/08/2014 in Berachampa, West Bengal. Stakeholders belonging to different groups had been invited to comment on the PoA by email and in the physical meeting. 33 people, representatives the following groups, took part:

- Traditional stove users
- Users of an ICS (TLUD)

- Field assistants working in a pilot project
- A charcoal retailer
- A representative of the West Bengal Forest Department
- Religious Leaders
- NGO representatives

The stakeholder consultation was conducted at PoA level, since the technology and its impacts will be similar in the entire PoA. 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 the Servals TLUD
- A CPA is implemented by another institution than the CME.

F.2. Summary of comments received

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Participants commented and asked questions about the structure of the PoA, the role of carbon credits in funding, the expected price of the ICS; and about several features of the TLUD which was presented as ICS to be used in the first CPA, such as asking for life time and suggesting regular maintenance. It was also asked about charcoal generation and charcoal use, suggesting to use charcoal as near as possible to where it is produced in ICS. Moreover, participants asked what impacts the PoA would have on the local level, particularly regarding job creation.
Apart from these direct question, participants evaluated possible social and environmental impacts of the PoA.

F.3. Report on consideration of comments received

>>
All questions asked were answered by the CME and the project participants. Since virtually all comments were positive, no change of the PoA design in required. Special emphasis will however be put on ICS maintenance, moreover, it will be searched for local charcoal buyers.
A detailed report on the stakeholder consultation has been submitted to the DOE.

SECTION G.   Approval and authorization

>>
LoAs of the Indian DNA have been received.

PART II.   Generic component project activity (CPA), for a CPA applying three methodologies (i.e., claiming ER for the use of renewable biomass as fuel in ICS, among others)

SECTION A.   General description of a generic CPA

A.1. Purpose and general description of generic CPAs

>>
The project activity aims at reducing the fuel wood consumption and indoor air pollution of traditional stove users in India by disseminating Improved Cook Stoves (ICS) of the type XXX at subsidized

prices. Where improved wood gasifier cook stoves will be distributed, also 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. ICS users may also be provided with renewable biomass to operate ICS, allowing to reduce CO_2 emissions from fuel consumption to zero.

SECTION B.   Application of a baseline and monitoring methodology and standardized baseline

B.1.   Reference of methodology(ies) and standardized baseline(s)

>>

The activity applies three small scale baseline and monitoring methodologies:

- AMS–II.G, version 07[1]: "Energy Efficiency Measures in Thermal Applications of Non-Renewable Biomass". This methodology will be applied in any case.

- AMS–III.BG version 03[2]: "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.

- AMS-I.E, version 06[3]: "Switch from Non-renewable biomass for thermal applications by the users". ER will be claimed under this methodology in activities where renewable biomass will be provided to ICS users.

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

B.2.   Applicability of methodology(ies) and standardized baseline(s)

>>

Methodology AMS-II.G, version 07, "Energy Efficiency Measures in Thermal Applications of Non-Renewable Biomass" is applicable because the "category comprises appliances involving the efficiency improvements in the thermal applications of non-renewable biomass" (para. 1). Examples of these technologies and measures include the introduction of high efficiency biomass fired cook stoves or ovens or dryers and/or improvement of energy efficiency of existing biomass fired cook stoves or ovens or dryers." All ICS distributed under this PoA will be portable or in situ single or multi pot stoves that, will have a thermal efficiency of over 20 as per AMS-II.G, version 7, Para. 3. All ICS will replace existing traditional wood stoves; therefore, no green field installations are included.

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[4].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

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[1]http://cdm.unfccc.int/methodologies/DB/KZ6FQOCEEHD1V02ARWTW1W2R9G45BX

[2]http://cdm.unfccc.int/methodologies/DB/MVOAXD3LGD4ZJEKEERCT39ZLJ3JZA0

[3]http://cdm.unfccc.int/methodologies/DB/WHTQUFLWCVNB9CIUZC198A712WGQR4

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

+ 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 at157 million tonnes or 235 million cu.m.[5]. However, the production of firewood from forests estimated by FSI (Forest Survey of India) is only 40 million cu.m.[6]. Thus, there was a gap of 195 million cu.m. in demand and production of firewood. Thus it is established that non-renewable biomass has been used in India since 31 December 1989, using official reports of the Government of India. Thus, it is clear from the above arguments that the wood resources in India are constrained with respect to extraction which has increase data much higher rate as compared to increase in forests (including outside forests/wooded land) and non renewable biomass extraction is prevalent since 1989.

The limit for applying AMS-II.G corresponds to 180 GWh of thermal energy savings, the CPA will not claim ER above this limit. The CPA includes the distribution of approximately XXX ICS, each of which is expected to save XXX tons of woody biomass annually, corresponding to total savings of XXX tons of woody biomass, corresponding to XXX TJ (applying the IPCC default value for wood fuel, 0.015 TJ/ton) or XXX GWh thermal.

During verifications the DOE will assess that the small scale limit (180 GWh thermal per CPAs) was not exceeded at any time for any CPA.

Methodology AMS–III.BG, version 03: "Emission reduction through sustainable charcoal production and consumption" is applicable for the generation of charcoal in micro gasifier stoves at household level and its supply to identified consumers included in the project boundary (para. 2 & 3). The CPA also applies AMS-II.G, which is a precondition for using AMS–III.BG with micro gasifier stoves. The project activity installs and operates new (greenfield) charcoal production facilities characterized by a new investment. No micro gasifier stoves are disseminated that require auxiliary power consumption in a blower or fan for forced convection. Methane produced during charcoaling process is gainfully used for heat (cooking). Users of charcoal may include (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 will not include large scale industries. Charcoal users will sign agreements stating that they will not claim ER for the use of the charcoal provided under this CPA.

The biomass used for charcoal production will be biomass used for cooking by households in micro gasifier stoves, without chemical handling or storage of more than one year.

In order to meet the corresponding small-scale limit of 60,000 tons of annual CO_2 reduction (EB86 annex 13), the total amount of conventional charcoal to be replaced is limited to approximately 8,000 tons and the maximum ICS number to XXX. During verifications, the DOE will assess that the small scale limit (60,000 tons of annual CO_2 reduction per CPAs) was not exceeded at any time for any CPA.

AMS-I.E, version 06, "Switch from non-renewable biomass for thermal applications by the user" is applicable because this category comprises activities to displace the use of non-renewable biomass by introducing renewable technologies (para. 1). Where ICS are operated with renewable biomass,

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[5]http://www.fsi.nic.in (page 46; section 3.7)

[6]http://www.fsi.nic.in (page 46; section 3.8)

they represent a renewable energy technology. It will be demonstrated that biomass qualified as renewable biomass fulfils the criteria of EB 23 annex 18, cited in AMS-I.E.

The corresponding small-scale limit is 45MW$_{th}$ (CDM-EB65-A05-STAN ver. 09.0), corresponding to approximately XXX ICS operated with renewable biomass, based on a per-ICS capacity of XXX kW. During verifications the DOE will assess that the small scale limit (45MW$_{th}$ per CPA) was not exceeded at any time for any CPA. ICS that do not qualify as renewable technology because they do not use RB and do not claim ER under AMS-I.E will not be accounted towards the SSC limit of AMS-I.E (however the limit of AMS-II.G will apply).

Table summarizing applicability criteria:

Criterion	Justification of applicability
AMS-II.G, version 07	
2.1 Para. 2: "The category comprises appliances involving the efficiency improvements in the thermal applications of non-renewable biomass. Examples of applicable technologies and measures include the introduction of high efficiency biomass fired cook stoves..."	The purpose of the CPA is the distribution of improved cook stoves (ICS) consuming woody biomass, particularly micro gasifier stoves, that are highly efficient in comparison to traditional wood stoves which constitute the baseline scenario. All ICS will replace existing traditional wood stoves; therefore, no greenfield installations are included. (as requested in footnote 1).
2.1 Para. 3: In the case of cook stoves, the methodology is applicable to introduction of single pot or multi pot portable or in-situ cook stoves with rated efficiency of at least 20 per cent.	ICS distributed under the CPA are portable single or multi pot stoves. The thermal efficiency surpasses 20%; for the Servals TLUD gasifier stoves, the MMSME (Ministry of Micro-, Small- and Medium Enterprises) certified a thermal efficiency of 36.9% (appendix 3 of the specific CPA-DD).
2.2 Para. 2: Non-renewable biomass has been used in the project region since 31 December 1989.	See justification in the text.
2.2 Para. 1. The small scale limit for AMS-II.G corresponds to 180 GWh thermal energy savings.	See justification in the text.
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 mico-gasifier stoves using biomass for cooking and not using auxiliary power in blowers or fans, such as the Servals TLUD(see section A.6 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.
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.	Charcoal users will sign agreements stating that they will not claim ER for the use of the charcoal provided under this CPA.
Para. 6-9: Project activity, except for the case indicated in paragraph 3 above, shall ...	Not applicable since para. 3 is applicable; para. 6-9 refer to charcoal production in improved kilns, while the CPA is about charcoal generated in micro gasifier stoves.
Para. 10, 11: 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. 12: The embedded energy in charcoal produced as by-product in micro-gasifier stoves shall be neglected when performing water boiling test.	Charcoal produced is not considered for calculating stove efficiency, see sample WBT in appendix 3.
The small-scale limit for AMS-III.BG corresponds to 60,000 tons (CDM-EB65-A05-STAN ver. 09.0).	See justification in the text.
AMS-I.E, version 6	
Para. 2: "This methodology comprises of activities to displace the use of non-renewable biomass by introducing renewable energy technologies. Examples of these technologies include, but are not limited to biogas stoves, solar cookers, passive solar homes, renewable energy based drinking water treatment technologies (e.g. sand filters followed by solar water disinfection; water boiling using renewable biomass)."	Where ICS are operated with renewable biomass, they represent a renewable energy technology, comparable to biogas stoves. It will be demonstrated that biomass qualified as renewable biomass fulfils the criteria of EB 23 annex 18, moreover, that there is availability of surplus biomass in accordance with the General guidance on leakage in biomass project activities (EB 47, Annex 28).
Para. 3: Project participants are able to show that non-renewable biomass has been used since 31 December 1989, using survey methods or referring to published literature, official reports or statistics.	See justification in the text under applicability of AMS-II.G.

The small-scale limit for AMS-I.E is 45MW$_{th}$ (CDM-EB65-A05-STAN ver. 09.0).	See justification in the text.

B.3. Sources and GHGs

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Source			GHGs	Included?	Justification/Explanation
Baseline scenario	Cooking on traditional stoves with fuelwood		CO_2	Yes	Important source of emissions
			CH_4	No	Important source of emissions, but excluded for the sake of conservativeness, according to AMS-II.G and AMS-I.E.
			N_2O	No	Excluded for the sake of conservativeness.
	Use and production of conventional charcoal		CO_2	Yes	Important source of emissions
			CH_4	Yes	Included according to AMS-III.BG for traditional charcoal production, for the share of charcoal produced with biomass deemed renewable.
			N_2O	No	Excluded for the sake of conservativeness.
Project scenario	Cooking on traditional stoves with fuelwood		CO_2	Yes	Important source of emissions
			CH_4	No	Less relevant than in the baseline scenario, where it is also excluded.
			N_2O	No	Less relevant than in the baseline scenario, where it is also excluded.
	Use and production of conventional charcoal		CO_2	Yes	Important source of emissions
			CH_4	No	According to AMS-III.BG, not considered since micro gasifier stoves use pyrolysis gas for heat generation for cooking.
			N_2O	No	Less relevant than in the baseline scenario, where it is also excluded

B.4. Description of baseline scenario

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As per AMS-II.G, version 07, AMS-III.BG, version 03, and also AMS-I.E, version 06, 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
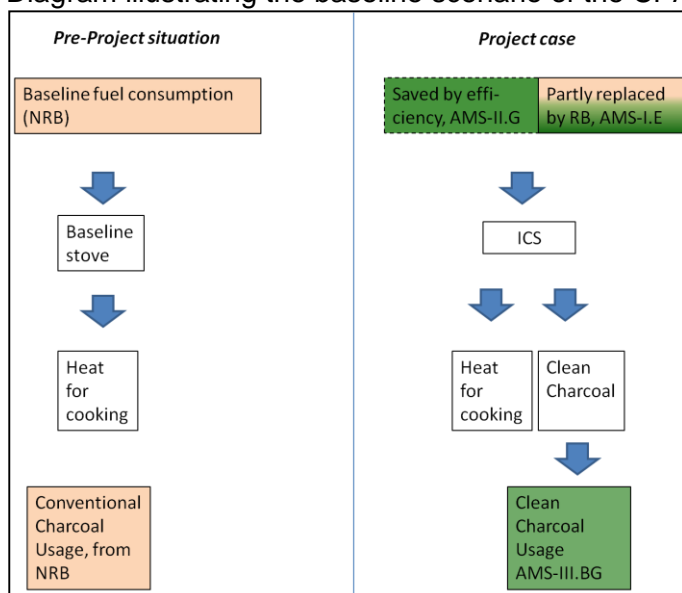
charcoal). ER will only be claimed for charcoal generated as a by-product in cooking in ICS for which ER are also claimed under AMS-II.G. Since this charcoal will be used outside the ICS, according to AMS–III.BG, charcoal will not be considered in the WBT when evaluating the ICS's efficiency. Another 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.

Regarding the component on usage of renewable biomass in ICS (using it as a renewable technology according to AMS-I.E), the baseline consists in the use of conventional fuelwood in the ICS. ER will only be claimed for the use of RB in ICS that are distributed under the PoA and for which ER are also claimed under AMS-II.G, i.e., no ER will be claimed for the usage of RB in traditional stoves or any other appliances.

Picture: TLUD users with charcoal generated within a fortnight

Diagram illustrating the baseline scenario of the CPA

B.5. Demonstration of eligibility for a generic CPA

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Nr	Eligibility Criteria		Mean of proof / Evidence Document (to be checked at CPA inclusion)
	Category	Description	
1	Ref: EB 87, Annex 03 Par.18(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.7, specifying location and boundary of the CPA. Additionally, a statement from CPA operator/CME that the boundary is within India.
2	Ref: EB 87, Annex 03 Par.18 (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 B/D.7.2, describing the unique ICS numbering system for this CPA.
3	Ref: EB 87, Annex 03 Par.18 (c): 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)agroupofhouseholdsservedbyacharcoalmarket(e.g.charcoal consuming urban areas). End users must not include large scale industries.	Evidence for inclusion: CPA-DD section A.5, 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.
4	Ref: EB 87, Annex 03 Par.18 (d): 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 23/05/2014.	Evidence for inclusion: CPA-DD section A.8.1, specifying the CPA start date. Moreover, evidence on the CPA start date will be provided to the DOE.
5	Ref: EB 87, Annex 03 Par.18 (e): Conditions that ensure compliance with applicability and other requirements of single or multiple	For all CPAs that will be included in this PoA, the use of multiple methodologies (AMS-II.G version 07, AMS–III.BG. version 03 and AMS-I.E, version 06) shall be justified.	Document: CPA-DD, section B.2/D.2. Evidence for the applicability of specific methodologies described below.
		Applicability of AMS-II.G:	Evidence for inclusion:

	methodologies applied by CPAs	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%.	CPA-DD section A.5, 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.
		Applicability of AMS-I.E: There shall be ICS in the CPA operated with renewable biomass, thus representing a renewable energy technology. Only residual biomass will be considered in the PoA, in line with the definition given in EB 23 annex 18, constituting biomass by-products, residues and waste streams from agriculture, forestry, and related industries. Also leakage will be excluded, according to Leakage in biomass small-scale project activities methodological tool (EB 83, Annex 15).	Evidence for inclusion: CPA-DD section A.5, specifying on type(s) of ICS used and types of residual biomass used, including a description of the residual biomass in accordance to EB 23 annex 18 and an assessment of the availability of surplus biomass in accordance with the General guidance on leakage in biomass project activities (EB 83, Annex 15).
6	Ref: EB 87, Annex 03 Par.18 (f): The conditions that ensure that the CPA meets the requirements pertaining to the demonstration of additionality	Additionality is demonstrated as described in detail in Section B.1 of the PoA DD, applying paragraph 11.(c) of EB 83Annex 14; and making reference to the debundling check which applies even stricter criteria.	Evidence for inclusion: CPA-DD section A.12, showing that the CPA passes the debundling check. Moreover, evidence on the energy savings and thermal capacities of ICS types used.
7	Ref: EB 87, Annex 03 Par.18 (g): The PoA-specific requirements stipulated by the CME including any conditions related to undertaking local stakeholder consultations and environmental impact analysis	The local stakeholder consultation will be conducted at the PoA level (Section F of the PoA-DD). 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:	Evidence for inclusion: Check of documentation of stakeholder consultation, CPA-DD section C, in cases where: - A CPA is included with a boundary reaching outside West Bengal, or - A CPAs is included applying another stove technology than the Servals TLUD, or

		- A CPA is included with a boundary reaching outside West Bengal, or - A CPAs is included applying another stove technology than the Servals TLUD, or - A CPA is implemented by another institution than the CME An environmental impact analysis is not required (section E.2 of the PoA-DD).	- A CPA is implemented by another institution than the CME
8	Ref: EB 87, Annex 03 Par.18 (h): 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 and 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: Statement of CME and the CPA operator (in case of being different from the CME) on use of ODA. In case of ODA involved in funding or pre-funding parts of a CPA, a confirmation that no diversion of ODA occurs will be provided.
9	Ref: EB 87, Annex 03 Par.18 (i): 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 regional partners such as the Sapient Infotech (Sapient).	Evidence for inclusion: CPA-DD section A.5, 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.
10	Ref: EB 87, Annex 03 Par.18 (j): 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 including all annexes and amendments till EB 86Annex 03.	Evidence for inclusion: CPA-DD section B/D.7.2, describing the sampling plan. In case the CPA is not implemented by the CME itself, an agreement will be signed with the CME defining responsibilities and duties of the implementing agent.
11	Ref: EB 87, Annex 03 Par.18 (k): Where applicable, the conditions that ensure that every CPA (in aggregate if it comprises of independent sub units) meets the small-scale or microscale threshold and remains within those thresholds throughout the crediting period of the CPA	The CPA will remain under the applicable SSC limits for each component: For AMS-II.G: Threshold of 180 GWh/a thermal energy savings (threshold as per clarification request SSC_233) for all ICS distributed under the CPA. For AMS–III.BG.: Threshold of total ER of 60,000 t CO2e per year, for the total amount of charcoal provided to charcoal users. For AMS-I.E: Threshold of 45 MW$_{therm}$ accumulated capacity, for all ICS using renewable biomass.	Evidence for inclusion: CPA-DD section B.2/D.2 and the ER calculation spreadsheet in appendix 3, calculating, in relation to the SSC limits - the estimated maximum number of ICS to be distributed - the estimated maximum amount in total of charcoal to be provided to charcoal users and, - the estimated maximum number of ICS using renewable biomass. During verifications the DOE will assess that the small scale limits were not exceeded at any time for any CPA.

			Additional evidence: Stove producer's specifications on stove capacity.
12	Ref: EB 87, Annex 03 Par.18 (l): Where applicable, the requirements for the debundling check, in case the CPAs belongs to small-scale or microscale project categories.	If each of the independent subsystems/measures included in the CPA of a PoA is no larger than 1% of the small-scale thresholds defined by the methodologies applied, then the is exempted from performing de-bundling check (EB 83, annex 13). 1% of SSC limits correspond to energy savings of 1.8 GWh, ER of 600t CO_2 annually or an installed capacity of 450 kW$_{th}$.	Evidence for inclusion: CPA-DD, section A.12, showing that each ICS distributed under the CPA is clearly below 1% of each of the relevant SSC thresholds. Additional evidence: Stove producer's specifications on stove capacity.
13	Approval of CPA by CME	The CME approves each CPA to be included into its registered PoA.	Evidence for inclusion: Statement of CME giving approval for the CPA to be included into its registered PoA.
14	CER ownership	End users receiving ICSs under the specific CPA as well as charcoal users receiving charcoal from the CPA contractually cede their rights to claim and own emission reductions under the Clean Development Mechanism of the UNFCCC to the CME of the PoA.	Evidence for inclusion: A default sales agreement for end users including the provision that emission reductions generated by the stove are owned by the CME will be provided for each CPA.
15	Awareness and agreement of those operating a CPA on PoA subscription	Contractual provisions to ensure that those operating the CPA are aware and have agreed that their activity is being subscribed to the PoA.	Evidence for inclusion, in case CPA operators are different from the CME: A declaration from CPA operators, stating that they are aware and have agreed that their activity is being subscribed to the PoA will be provided for each CPA.

B.6.   Estimation of emission reductions of a generic CPA

B.6.1. Explanation of methodological choices
>>
Emission reductions are calculated by summarizing ER from the stove efficiency-component (applying AMS-II.G), the charcoal-production-component (applying AMS–III.BG) and the renewable biomass component (applying AMS-I.E).

(equation 1)

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

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
$ER_{I.E}$ Emission reductions of the renewable biomass usage component, using the ICS as a renewable energy technology

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. 11:

(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_2e
$ER_{y,i,j}$	Emission reductions by project device of type i *and* batch j during year y in t CO_2e

and   equation (3)

$$ER_{II.G,y,i,j} = B_{y,savings,i,j} \times N_{y,i,j} \times \frac{\mu_{y,i,j}}{365} \times f_{NRB,y} \times NCV_{biomass} \times EF_{projected\_fossil\,fuel}$$

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 (fNRB) values available on the CDM website.
$NCV_{biomass}$	=	Net calorific value of the non-renewable woody biomass that is substituted (IPCC default for wood fuel, 0.015 TJ/tonne, based on the gross weight of the wood that is 'air-dried')
$EF_{projected\_fossilfuel}$	=	Emission factor for the fossil fuels projected to be used for substitution of non-renewable woody biomass by similar consumers. Use a value of 81.6 t CO2/TJ
$N_{y,i,j}$	=	Number of project devices of type *i* and *batch j* operating during year *y*,
$\mu_{y,i,j}$	=	Number of days of utilization of the project device *i* and batch *j* during the year *y*.

$$LE_y \qquad = \quad \text{Leakage emissions in the year } y$$

$N_{y,i,j}$ 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 365, following the final response of the SSC-WG on request 713, stating that It may be set to 1 (365/365) if the number of days for which the project stove's operation does not face any constraint. (Moreover, since equation 7 of AMS-II.G vers. 7 is applied, ER are based on the woody biomass used in the project devices which is monitored accurately anyways).

$B_{y,savings,i,j}$ 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 17, WBT) is chosen, with the corresponding formula (equation 7 of AMS-II.G version 7):

(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.

As specified under B.7.1, $B_{y=1,new,i,survey}$ may be monitored directly or it may be calculated based on average weekly fillings ($fillings_{i,y=1}$) and the average load of a batch-fed ICS ($load_{i,y=1}$).

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

(equation 5)

$$ER_{II.G,y} = \sum_i \sum_j B_{y=1,new,i,survey} \times \left(\frac{\eta_{new,i,j}}{\eta_{old,i,j}} - 1\right) \times 0.95 \times N_{y,i,j} \times \frac{\mu_{y,i,j}}{365} \times f_{NRB,y} \times NCV_{biomass}$$
$$\times EF_{projected\_fossil\,fuel}$$

Determination of the Share of Non-Renewable Biomass

According to AMS II.G, par. 26, equation 9, the following equation shall be used to calculate f_{NRB}:

(equation 6)

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

where:

$f_{NRB,y}$: fraction of non-renewable biomass (%)
NRB: non renewable biomass (tons)
DRB: Demonstrably renewable biomass (tons)

f_{NRB} will be calculated for each CPA.

Leakage

According to AMS-II.G the following potential sources of leakage have to be considered:

A) Use of NRB savings by non-project households

According to AMS-II.G para.28 the default net to gross adjustment factor of 0.95 is applied to account for leakage and therefore surveys are not required.

B) Transfer of Equipment

"If equipment currently being utilised is transferred from outside the boundary to the project activity, leakage is to be considered."

This leakage source can be ruled out since no used improved cookstoves will be transferred or deployed from outside the geographical project boundary to the project activity.

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)

$$ER_{III.BG,y} = \sum_i Q_{CCP,i_y} \times \left[\left(CF \times NCV_{wood} \times \frac{NCV_{charcoal}}{NCV_{charcoal,default}} \times f_{NRB,BL,wood} \times EF_{projected\_fossilfuel} \right) \right.$$

$$\left. + \left(SMG_{y,b} - M_d \right) \times \left(1 - f_{NRB,BL,wood} \right) \times GWP_{CH4,y} \right] - PE_{y,fugitive} - PE_{y,flaring}$$

$$- PE_{FF,y} - PE_{El,y} - PE_{BC,y}$$

Where:

$ER_{III.BG,y}$

= Emission reductions in year *y* (t CO_2e/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)
$GWP_{CH4,y}$	=	Global warming potential of methane applicable to the crediting period (t CO_2e/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)

$$PE_{y,fugitive} = \sum_i Q_{CCP,iy} \times GWP_{CH4,y} \times SMG_{y,b} \times f$$

Where:

$PE_{y,fugitive}$	=	Fugitive emissions from operation of charcoal producing facility (physical leakage) in the year y (t CO_2e)
f	=	A fraction attributed to project charcoal production technology, use a default value of 0.1.

Equations 7 and 8 can thus be combined and simplified:

(equation 9)

$$ER_y = \sum_i Q_{CCP,i_y} \times \left[\left(CF \times NCV_{wood} \times \frac{NCV_{charcoal}}{NCV_{charcoal,default}} \times f_{NRB,BL,wood} \times EF_{projected\_fossilfuel} \right) \right.$$

$$\left. + SMG_{y,b} \times \left(0.9 - f_{NRB,BL,wood} \right) \times GWP_{CH4,y} \right]$$

$f_{NRB,y}$ is determined as described in this section B.6.1 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".

Emission reductions from the use of renewable biomass (RB) in selected ICS (AMS I.E)

If conventional fuel used in some or all of the ICS distributed is replaced by renewable biomass, for example by pellets produced from waste biomass such as rice husk, additional ER are possible. For the calculation of these ER, AMS-I.E version 06 is applied. In a CPA it may also be specified that no ERs are claimed from the use of RB as fuel in ICS.

Emission reductions from the renewable biomass component in the ICS are calculated according to par. 11 of AMS-I.E:

(equation 10)

$$ER_{I.E,y} = B_{IE,y} \times f_{NRB,y} \times NCV_{biomass} \times EF_{prjected\_fossilfuel} - PE_{BC,y}$$

where:

$B_{I.E,y}$ Quantity of woody biomass that is substituted or displaced in tonnes by the use of renewable biomass as fuel in ICS.

f_{NRB}, $NCV_{biomass}$ and $EF_{projected\_fossilfuel}$ are determined as described in this section B.6.1 under AMS-II.G.

Par12a) from AMS-I.E is chosen to determine $B_{I.E,y}$: The average annual consumption of woody biomass per ICS is multiplied with the number of appliances burning renewable biomass.

The average annual consumption of woody biomass per ICS is already monitored as per the requirements of AMS-II.G, as $B_{y=1,new,i,survey}$. Where RB is completely replacing fuelwood used in the ICS, $B_{I.E,y}$ can be determined as:

(equation 11)

$$B_{I.E,y} = B_{y=1,new,i,survey} \times N_{I.E,y} \times 0.95 \times 0.95$$

Where:

$B_{y=1,new,i,survey}$ As defined under equation 4, $B_{y=1,new,i,survey}$ is the amount of biomass consumed in the ICS, representing the baseline fuel consumption of the use of RB in an ICS under the PoA

$N_{I.E,y}$ Number of appliances exclusively burning renewable biomass

$N_{I.E,y}$ will be determined from a database including all ICS users provided with RB during period y. $N_{I.E,y}$ will be a subset of $N_{y,i,j}$, i.e., only ICS users that are also considered for $ER_{II.G,y}$ will be considered for $ER_{I.E,y}$

Additionally to the net to gross adjustment factor of 0.95 according to par. 19 of AMS-I.E for the consideration of leakage, a conservativeness factor of 0.95 is included in equation 11 in order to account for a possible exceptional use of other biomass.

In summary, for the case of exclusive use of RB in ICS pertaining to $N_{I.E,y}$, a combination of equations 10 and 11 leads to:

(equation 12)

$$ER_{I.E,y} = B_{y=1,new,i,j,survey} \times N_{I.E,y} \times 0.9025 \times f_{NRB,y} \times NCV_{biomass} \times EF_{prjected\_fossilfuel}$$

In monitoring it will be shown based on a representative random sample of users included in $N_{I.E,y}$ that those users use RB exclusively.

Where RB is not used exclusively by ICS users (for example due to only seasonal availability), $B_{I.E,y}$ can be determined based on $RBtotal_y$, the monitored total amount of RB delivered to those users:

(equation 13)

$$B_{I.E,y} = RBtotal_y \times 0.95$$

Where:

$RBtotal_y$ total amount of RB delivered to those users (monitored)

Leakage:

Leakage related to the non-renewable woody biomass saved by the project activity is already considered under AMS-II.G. Potential leakage due to equipment that is transferred from outside the boundary to the project activity source can be ruled out since the no used ISC systems will be transferred or deployed from outside the project boundary.

B.6.2. Data and parameters fixed ex-ante

>>

Data / Parameter:	μ_y
Data Unit:	#
Description:	Number of days of utilization of the ICS during the year 'y'.
Source of data:	AMS-II.G, version 07, and final response of the SSC WG on request 713.
Value(s) applied:	365
Choice of data or Measurement methods and procedures:	μ_y is set to 365, following the final response of the SSC-WG on request 713, stating that it may be set to 1 (365/365) if the number of days for which project stoves operation does not face any constraint. (Moreover, since equation 7 of AMS-II.G version 7 is applied, ER are based on the woody biomass used in the project devices which is monitored accurately anyways).
	In the case where the efficient project stove was operated only for a part of the year due to logistics of the stove distribution during the initial phase of the project implementation, as also mentioned in final response of the SSC-WG on request 713, the provisions for monitoring of parameter $N_{y,i,j}$ in section B.7.1 guarantee that only the real operation time is considered.
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 07, default value
Value(s) applied:	0.10
Choice of data or Measurement methods and procedures:	According to AMS II.G, ver. 7, Table 14, 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.
Purpose of data:	Calculation of baseline emissions
Additional comment:	

Data / Parameter:	NCV_{wood} or $NCV_{biomass}$
Data Unit:	TJ/tonne
Description:	Net calorific value of the non-renewable woody biomass that is substituted
Source of data:	AMS-II.G, version 07, default value
Value(s) applied:	0.015
Choice of data or Measurement methods and procedures:	This is the IPCC default value for wood fuel as provided by AMS II.G version 07, para. 11.
Purpose of data:	Calculation of baseline emissions
Additional comment:	

Data / Parameter:	$NCV_{charcoal,default}$
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:	$f_{NRB,y}$
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:	The value will be defined in each CPA. For preliminary calculations, a value of 96.24% is applied (value for West Bengal)
Choice of data or Measurement methods and procedures:	See B.6.1
Purpose of data:	Calculation of baseline emissions
Additional comment:	

Data / Parameter:	$EF_{projected\_fossilfuel}$
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 07, default value under para. 11.
Value(s) applied:	81.6
Choice of data or Measurement methods and procedures:	Default value as provided by AMS II.G version 07, par.11
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 07, para 28, $B_{y,i,j,savings}$ 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	Default value given in AMS–III.BG, version 3

Measurement methods and procedures:	
Purpose of data:	Calculation of baseline emissions
Additional comment:	

Data / Parameter:	GWP_{CH4}
Data Unit:	t CO_2e/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.6.3. Ex-ante calculations of emission reductions

>>
Emission reductions are calculated by summarizing ER from all three components (see *equation 1*)

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

According to *equation 5,* emission reductions for the energy efficiency component are calculated as (see B.6.1):

(equation 5)

$$ER_{II.G,y} = \sum_i \sum_j B_{y=1,new,i,survey} \times \left(\frac{\eta_{new,i,j}}{\eta_{old,i,j}} - 1\right) \times 0.95 \times N_{y,i,j} \times \frac{\mu_{y,i,j}}{365} \times f_{NRB,y} \times NCV_{biomass}$$
$$\times EF_{projected\_fossil\ fuel}$$

The only parameters that are not determined ex-ante are $B_{y=1,new,i,survey}$, $\eta_{new,i,j}$ and $N_{y,i,j}$, which are monitored or calculated from monitored values (see B.7.1).

$(\frac{\eta_{new,i,j}}{\eta_{old,i,j}} - 1)$ 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.7.1)

$B_{y=1,new,i,survey}$ is preliminarily fixed as 1.6 t/a (see B.7.1). Cases where households do not use their ICS will be considered as drop-out. No drop-out is assumed for preliminary calculations.

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

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

$Q_{CCP,i,y}$ will be monitored, it is preliminarily set to 320kg (20% of $B_{y=1,new,i,survey}$) per ICS. $NCV_{charcoal}$ will also be monitored, it is preliminarily set to 29.5 GJ/t. All other parameters are fixed ex-ante.

Emission reductions from the renewable biomass component are calculated using *equation 12*

$$ER_{I.E,y} = B_{y,new,i,survey} \times N_y \times 0.90 \times RBusage_y \times f_{NRB,y} \times NCV_{biomass} \times EF_{prjected\_fossilfuel}$$

We assume a value of 1.6 tons (see B.7.1) of fuelwood per stove for $B_{y=1,new,i,survey}$ *and a value of 10% for RBusage_y.*

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	$B_{y=1,new,i,survey}$	Monitored	tons/a	1.60
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	%	20.0%
C	η_{old} (efficiency of replaced stove)	AMS-II.G default	%	10%
D	L_y: Discount for leakage	AMS-II.G and AMS-I.E default		0.95
E	$B_{y,savings,i,j}$ per stove	A * ((B/C) - 1) * D	tons/a	1.52
F	f_{NRB}: fraction of non-renewable biomass	NRB/(NRB+DRB), preliminary value for West Bengal	%	96.24%
G	$EF_{projected\_fossilfuel}$	AMS-II.G default	tCO2/TJ	81.60
H	$NCV_{biomass\ or\ wood}$	AMS-II.G default	TJ/t	0.015
ER$_{II.G}$ per ICS		*E*F*G*H*	**tons/a**	**1.79**

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	0.32
K	CF: Conversion factor wood to charcoal	AMS-II.G defautls, IPCC guidelines		6
L	$NCV_{charcoal}$ / $NCV_{charcoal,default}$	Monitored, prelim. set 1		1
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*I*L*G*H)+(M*(0.9-G)*N))	tCO2/a	**2.25**

Share of ICS using exclusively RB		Monitored	%	100%
Discount factor for exceptional use of NRB		Equation 11		95%
additional ER$_{I.E}$ **per TLUD using RB**			tCO2/a	**1.70**

Possible total ER per ICS	**tCO2/a**	**5.74**

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

B.7. Application of the monitoring methodology and description of the monitoring plan

B.7.1. Data and parameters to be monitored by each generic CPA

Data / Parameter:	$B_{y=1,new,i,survey}$
Data Unit:	t/year
Description:	Quantity of woody biomass used by project devices in tonnes per device of type i.
Source of data:	Survey on $fillings_{y=i,1}$ and $load_{y=1,i}$ as described below.
Value(s) applied:	For ex-ante calculations: 1.6 tons annually per ICS, based on approximately 28 weekly loads of approximately 1.1kg each, taken from a pilot project.
Measurement methods and procedures:	$B_{y=1,new,i,survey} = fillings_{y=1,i} * load_{y=1,i} * 0.052$ (conversion factor to from kg /week to t/a) $fillings_{y=1,i}$: Average number of weekly fillings of a batch-loaded ICS type i in the first year A representative sample of randomly selected users will be 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. Where ICS are found not to be operational during monitoring, they will not considered here. $load_{y=1,i}$: Average amount of fuelwood used per filling of an ICS in the first year The average weight of a ICS fuelwood load will be determined as the average value obtained over all WBTs that are conducted to determine $\eta_{new,i,j}$: Most probably, the data from these WBTs will be sufficient to achieve the required precision, since the sample size for $\eta_{new,i,j}$ is expected to be larger than for $load_{y=1,i}$. If additional data are needed, they will be obtained by asking additional randomly selected users to start a normal cooking session and determining the weight of the filling. Alternatively, $B_{y=1,new,i,survey}$ may be monitored directly in cases where biomass is directly provided to the ICS users by the CPA implementer. Determined in the first year of the introduction of the devices (e.g. during the first year of the crediting period, y=1) through a sample survey including a measurement campaign (see B.7.1): For batch-loaded micro gasifier ICS, the amount of fuelwood used can be determined by measuring the average amount of fuelwood used per filling in a representative survey and asking the users to specify the number of fillings for each meal and the days of usage per week. Moreover, as mentioned in condition b), the sample survey clearly distinguishes the quantity of biomass used by the project device; it cannot be confused with biomass consumed in a baseline stove that may still be continued to use.
Monitoring frequency:	Only in the first year of the crediting period.
QA/QC procedures:	It will be assured that all requirements of the sampling plan of the CPA are met.

	Cross checks will be performed to confirm the plausibility of data obtained with cooking habits and the amount of charcoal collected from ICS users.
Purpose of data:	Calculation of baseline emissions
Additional comment:	

Data / Parameter:	$\eta_{new,i,j}$
Data Unit:	%
Description:	Efficiency of the device of each type *i and batch j* implemented as part of the project activity. calculated without accounting for the remaining charcoal
Source of data:	Primary data collection during monitoring campaigns by dedicated monitoring team based on WBT.
	The efficiency of the project devices was confirmed by the testing center of the Ministry of Micro, Small & Medium Enterprises.
	Efficiency losses will be monitored according to AMS-II.G version 07 para 21 c.
Value(s) applied:	Monitored, assumption for Ex-Ante Emission Calculation: 20%
Measurement methods and procedures:	Adjustment of $\eta_{new,i,j}$ due to efficiency loss will be monitored according to AMS-II.G version 07 para 21 c.
	The efficiency of the project devices of the first batch 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.
	The rate of loss in efficiency will be applied correspondingly to all batches.
	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:	

Data / Parameter:	$N_{y,i,j}$
Data Unit:	Number
Description:	Adjusted total number of ICS of type i and 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: 1
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 i) and the end of the monitoring period will be considered. Therefore, $N_{y,i,j}$ will include an adjustment factor by applying the following formula: $$N_{y,i,j} = Nsoldtotal_{y,i,j} * d_{average,y} / mplength_y$$ Where: $Nsoldtotal_{y,i,j}$ total number of ICS type i and batch j sold within monitoring period y $d_{average,y}$ average number of days the ICS sold in period y were operational in period y, derived from sales dates on sales contracts $mplength_y$ 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:	

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
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.7.2. Interviews will be reported in a questionnaire.
Monitoring frequency:	The CME 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 fuelwood consumed in micro gasifier stoves, based on preliminary WBT.

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 based on the exact weight but on the number of bags delivered, the following formula will apply:
	$$Q_{CCP,i,y} = weightbags_{y,i} * nbags_{y,i}$$
	Where:
	$weightbags_{y,i}$ average weight of bags of charcoal type i in period y
	$nbags_{y,i}$ total number of bags of charcoal type i in period y
	$nbags_{y,i}$ will be determined based on invoices/receipts of charcoal buyers.
	$weightbags_{y,i,}$ will be determined on sample basis in accordance with the sampling standard.
	Simultaneously, it will be checked that charcoal buyers are eligible according to para. 4 of AMS-III.BG version 03.
Monitoring frequency:	In batches, depending on the deliveries to charcoal buyers or retailers
QA/QC procedures:	The entire chain of charcoal collection will be documented, demonstrating how the amount of charcoal delivered to users of conventional charcoal relates to the amount generated by users.
	There will be cross checks with:
	- total quantity of charcoal generated by the micro gasifiers based on monitored fuelwood consumption and the observed conversion-rate to charcoal.
	- the average amounts of charcoal collected from stove users based on records of field assistant collecting charcoal
Purpose of data:	Calculation of baseline emissions
Additional comment:	-

Data / Parameter:	$NCV_{charcoal}$
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, appendix 1, deemed value
Value(s) applied:	Preliminary value: 29.5 (default given in AMS–III.BG for conventional charcoal)

Measurement methods and procedures:	Monitored once during the first year of the crediting period. Measurement is undertaken in laboratories according to relevant national/international standards. Measure quarterly, taking at least three samples for each measurement. Samples will be taken from the stocks of charcoal collected from users before selling it to charcoal users/retailers. The average value will be used for the rest of the crediting period provided that there is no change in the biomass types used for charcoal i production.
Monitoring frequency:	Quarterly during the first year of the crediting period.
QA/QC procedures:	Charcoal generated from other than purely woody sources will not be accepted by users of conventional charcoal since it will not be comparable to conventional charcoal.
	The consistency of the measurements will be checked by comparing the measurement results with relevant data sources (e.g. values in the literature, values used in the national GHG inventory) and default values by the IPCC.
	If the measurement results differ significantly from previous measurements or other relevant data sources, additional measurements will be conducted and/or justification will be provided.
Purpose of data:	Confirm applicability of way of calculation of baseline emissions
Additional comment:	

Data / Parameter:	$N_{I.E,y}$
Data Unit:	Number
Description:	Total number of ICS exclusively using RB in period y.
Source of data:	Central database - documentation on delivery of RB to ICS users by the implementing entity
Value(s) applied:	Assumption for Ex-Ante Emission Calculation: 1
Measurement methods and procedures:	The unique IDs of the ICS of all users receiving exclusively RB in period y will be registered in the central database. The documentation of the supply chain for renewable biomass will also include the amount of RB supplied to ICS users in total.
	Additionally, a sample of randomly selected ICS users included in $N_{I.E,y}$ will be interviewed in each sampling survey.
	Where RB is used exclusively (applying equation 13), ICS users will be asked if and since when they are provided with renewable biomass by the CPA implementer; and if no other fuel has been used since then (tolerating exceptional use of other woody biomass up to 5%) .
	Where RB is not used exclusively, ICS users will be asked to give details on fuel received from the CPA implementer and other fuels used in period y, in order to cross-check the parameter $B_{RB,y}$, derived from the monitored parameter $RBtotal_{,y}$.
	For all ICS that have been sold within the monitoring period, only the number of days between the sales date and the end of the monitoring period will be considered for $N_{I.E,y}$. Since $N_{I.E,y}$ is a subset of $N_{y,i,j}$, this adjustment will be considered automatically by the provisions explained in this section B.7.1 for the monitoring parameter $N_{y,i,j}$.
Monitoring frequency:	Annually or bi-annually.

QA/QC procedures:	Cross-checks with the total amount of RB supplied by the CPA implementer to ICS users.
Purpose of data:	Calculation of baseline emissions
Additional comment:	Only a single type of ICS will be considered under this parameter in per CPA.

Data / Parameter:	$RBtotal_y$
Data Unit:	tons
Description:	Total amount of RB provided to ICS uses included in $N_{I.E,y}$ in period y (only residual biomass will be used under this PoA).
Source of data:	Documentation of RB supply
Value(s) applied:	Monitored
Measurement methods and procedures:	Detailed monitoring is defined in specific CPA-DD. Measurements will be based on sales receipts of providers of RB to the CPA implementer and documentation of delivery of RB to ICS users. Moreover, for each source of RB supplied to ICS users, monitoring will assess if this source is fulfilling the criteria for DRB given in EB 23 annex 18 (definition of renewable biomass, cited in AMS-I.E footnote 5). Only residual biomass will be considered, i.e. biomass that constitutes biomass by-products, residues and waste streams from agriculture, forestry, and related industries. Moreover, monitoring will demonstrate that the use of that biomass residue in the project activity will not involve a decrease of carbon pools, in particular dead wood, litter or soil organic carbon, on the land areas where the biomass residues are originating from.
Monitoring frequency:	Annually or bi-annually.
QA/QC procedures:	Cross-checked with monitoring results for $N_{I.E,y}$ the total amount of RB supplied by the CPA implementer to ICS users.
Purpose of data:	Calculation of baseline emissions
Additional comment:	Only a single type of ICS will be considered under this parameter in per CPA.

Data / Parameter:	$DO_{I.E,y}$
Data Unit:	%
Description:	Statistically adjusted drop out from total population of ICS using RB and included in $N_{I.E,y}$ in period y
Source of data:	Primary data collection: dedicated monitoring team; database maintenance: CME
Value(s) applied:	Preliminary value: 5%
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. Interviews will be reported in a questionnaire.
Monitoring frequency:	The CME 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:	For ex-ante calculation of emission reductions, a value of 5% for $DO_{I.E,y}$ was assumed.

B.7.2. Description of the monitoring plan for a generic CPA

There will be a continuous documentation of all ICS distributions, charcoal collection and provision of RB 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 efficiency, usage, generation of charcoal and use of RB. Charcoal generation will be monitored through invoices/receipts from charcoal sales, moreover there the weight of charcoal bags will possibly be sampled. Use of RB will be monitored based on the provision of RB to ICS users.

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 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 to ensure completeness and accuracy of monitoring information. The basic information for ICSs distributed to households will be[7]:

- 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.

For usage of RB, there will be a database containing specific ICS and details on RB provision for these ICS.

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 shall be inserted in the distribution contract at the moment of distributing the stove.

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

Direct Monitoring

The following parameters will be monitored directly, as described in B.7.1, thus no sampling is necessary: $N_{y,i,j}$, $N_{I.E,y}$, $NCV_{charcoal}$ and possibly $Q_{CCP,i,y}$ (where possible). For monitoring $NCV_{charcoal,i}$, only three samples will be drawn, therefore the sampling standard is not applicable. 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).

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[7]The record keeping system should collect as many information as necessary to facilitate the Verification of the CERs. At the current point of time the list of information seems ideal but may be extended or condensed. The collection of all the items is therefore not mandatory and additional information may be collected as well.

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:

- $DO_{II.G,y}$

- $DO_{I.E,y}$

Mean parameters:

- $\eta_{new,i,j}$

- $fillings_{y=1,i}$

- $load_{y=1,i}$

The latter two parameters will be used to determine $B_{y=1,new,i,survey}$

- $weightbags_{y,i}$ (where applicable, used to determine $Q_{CCP,i,y}$)

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

$DO_{II.G,y}$, $DO_{I.E,y}$, $\eta_{new,i,j}$, $fillings_{y=1,i}$ and $load_{y=1,i}$ 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 $DO_{II.G,y}$, $DO_{I.E,y}$, $\eta_{new,i,j}$, $fillings_{y=1,i}$, $load_{y=1,i}$ (the latter two parameters in order to determine $B_{y=1,new,survey}$).

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 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.6.2. of the this generic 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 05.0 clarifies that *"[…] any requirements specified in the applicable methodologies having precedence"*.

Coverage of sampling requirements in the applicable methodology:
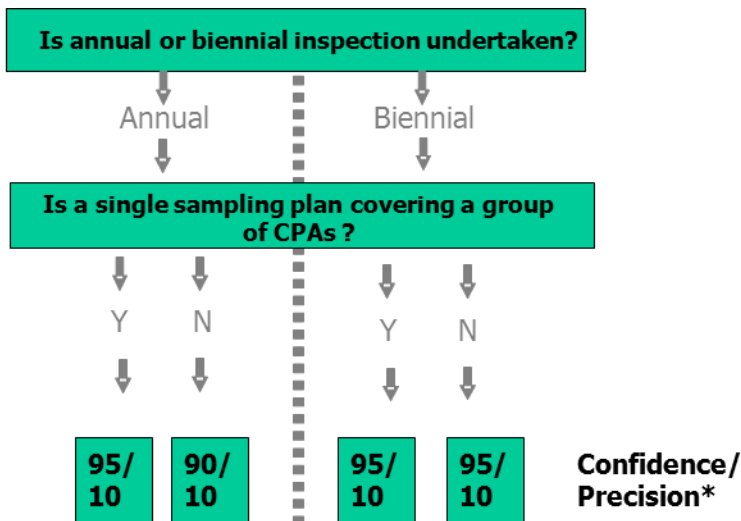
As per applicable methodologies AMS-II.G ver. 7. par. 36 and AMS-I.E, ver. 6, par. 26, *"when biennial inspection is chosen a 95% confidence interval and a 10% margin of error requirement shall be achieved for the sampling parameter. On the other hand when the project proponent chooses to inspect annually, 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 05.0.

        v. Confidence/precision criteria to be met

As mentioned above, according to AMS-II.G ver. 7, par. 36, confidence/precision criteria to be met is determined as follows:

Note: As per par. 36 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 $DO_{II.G,y}$, $\eta_{new,i,j}$, $fillings_{y=1,i}$ and $load_{y=1,i}$, the target population consists in all ICS which are included until the end of the specific monitoring period.

For the monitoring parameter $DO_{I.E,y}$, the target population consists in all ICS included in $N_{I.E,y}$ i.e., all ICS using RB as fuel in period y.

For the monitoring parameter $weightbags_{y,i}$, where applicable, 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. Also multi-stage sampling may be applied if deemed suitable by the CME. 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 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 $DO_{II.G,y}$ and $fillings_{y=1,i}$. For the monitoring of $\eta_{new,i,j}$ and $load_{y=1,i}$ that 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. $DO_{I.E,y}$ will be evaluated in an independent sample for all ICS using RB.

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
$DO_{II.G,y}$	xxx	xxx	xxx	xxx
$fillings_{y=1,i}$	xxx	xxx	xxx	xxx
$load_{y=1,i}$	xxx	xxx	xxx	xxx
$\eta_{new,i,j}$	xxx	xxx	xxx	xxx
$weightbags_{y,i}$	xxx	xxx	xxx	xxx
$DO_{I.E,y}$	xxx	xxx	xxx	xxx

Simple random sampling

Equations used for calculation of sample size according to CDM-EB67-A06_GUID vers. 04.0,:

Proportional parameters $DO_{II.G,y}$, $DO_{I.E,y}$

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

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 $B_{y=1,new,i,survey}$, $\eta_{new,i,j}$, $fillings_{y=1,i}$, $load_{y=1,i}$
($weightbags_{y,i}$- see cluster sampling)

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

Where:

V	$\left(\dfrac{SD}{mean}\right)^2$
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
$DO_{II.G,y}$	Biennial and/or	95/10	XXX	XXX	XXX	XXX
$fillings_{y=1,i}$			XXX	XXX	XXX	XXX
$load_{y=1,i}$			XXX	XXX	XXX	XXX
$\eta_{new,i,j}$			XXX	XXX	XXX	XXX
$DO_{I.E,y}$			XXX	XXX	XXX	XXX
			XXX	XXX	XXX	XXX
$DO_{II.G,y}$	one CPA,	90/10	XXX	XXX	XXX	XXX
$fillings_{y=1,i}$			XXX	XXX	XXX	XXX
$load_{y=1,i}$			XXX	XXX	XXX	XXX
$\eta_{new,i,j}$			XXX	XXX	XXX	XXX
$DO_{I.E,y}$			XXX	XXX	XXX	XXX

The largest number for the sample size, in this case the sample size calculated for $DO_{II.G,y}$, will be chosen for the sampling effort with one common survey for all parameters. For the monitoring of all other parameters except $DO_{I.E,y}$, a random sub-samples from the common sample will be drawn according to the calculated sample size of the parameter. For $DO_{I.E,y}$, an independent sample will be drawn from $N_{I.E,y}$.

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 ver.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 $\qquad = \left(\dfrac{SD}{Cluster\ mean}\right)^2$

M $\qquad =$ Total number of clusters (50 villages)

1.645 $\qquad =$ Represents the 90% confidence required

0.1 $\qquad =$ 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 CDM-EB67-A06-GUID vers.04..

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:

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

Where:

c   Number of sub-groups to be sampled

M   Total number of sub-group

ū   Number of units to be sampled per sub-group (pre-specified as 10 HH)

$\bar{N}$ Average Number of units per sub-group

$SD_B{}^2$ Unit variance (e.g. variance between villages)

$SD_W{}^2$ Average of the sub-group variances (average within village variation)

$\bar{p}$ Overall proportion

E   Relative precision (e.g. 0.1 for 10% precision)

       Z value for confidence level (e.g. 1.645 for 90% confidence level, 1,96 for 95%

z   confidence interval)

The framework for calculation of c for the parameter $DO_{II.G,y}$ 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
$\bar{N}$ *	$(N_A+ N_B+ N_C + N_D+…)/M$		
$\bar{p}$ *		(pA+pB+pC+pD+…)/ M	
$SD_B{}^2$*		See below	
$SD_W{}^2$*			See below
M (number ofclusters)	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

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

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

For different pre-defined number of units to be sampled per sub-groups (ū), different sample sites for c will result:

Example results table with input parameter u

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

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

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

Step 2.:
The households to be sampled within the selected sub-groups c, will be selected by simple random sampling by means of a computerized randomizer.

    e. Sampling Frame
        i. Identification or description of sampling frame

For parameters that are directly ICS-related, the sampling frame is the list containing all ICSs included until the end of the specific monitoring period.
For the monitoring parameter *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 (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
$DO_{II.G,y}$	$DO_{II.G,y}$	Statistically adjusted drop out from total population of appliances in period y
$B_{y=1,new,i,survey}$	*fillings$_{y=1,i,}$*	Average weekly fillings of the ICS
	load$_{y=1,i}$	Average load of the ICS per canister filling
$\eta_{new,i,j}$	$\eta_{new,i,j}$	Average efficiency of an ICS
$DO_{I.E,y}$	$DO_{I.E,y}$	Statistically adjusted drop out from total population of ICS using RB and included in $N_{I.E,y}$ in period y
$Q_{CCP,i,y}$	*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

$DO_{II.G,y}$ and $DO_{I.E,y}$: Drop outs are recorded when users are found to not use the stove any longer or not to use RB in it. 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 or if a user has not used RB over the entire time, it will be accounted as not is use over the entire period. Due to this conservative approach, seasonal effects will have no impact on the final result.

$fillings_{y=1,i}$ and $load_{y=1,i}$: No seasonal effects are expected for meal preparation, since the quantity of food prepared is independent from seasonal effects. There may be increased use of the ICS for other purposes such as boiling water in the monsoon season. Such other uses than cooking of daily food are conservatively not considered, by asking specifically for usage for meal preparation.

$\eta_{new,i,j}$: 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

$DO_{II.G,y}$ and $DO_{I.E,y}$: 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.

$fillings_{y=1,i}$ is determined by asking users for the average number of weekly loads of fuelwood burnt in their ICS, assigning them to specific meals, and days of usage per week.

$load_{y=1,i}$ is determined as the average weight of a ICS fuelwood load will be determined by applying the average value obtained over all WBTs that are conducted to determine $\eta_{new,i,j}$. As shown in the table on expected sample sizes for random sampling in this section, the expected sample size for the latter parameter is bigger than for $load_{y=1,i}$.

The latter two parameters are used to calculate $B_{y=1,new,i,survey} = fillings_{y=1,i} * load_{y=1,i} * 0.052$

$\eta_{new,i,j}$ 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-STAN ver. 09.0 par 112.

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

CME will apply the "3 sigma rule": 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 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.

PART III.   Generic component project activity (CPA), for a CPA applying two methodologies (i.e., claiming ER only for efficiency improvements and sustainable production of charcoal)

SECTION A.   General description of a generic CPA

A.1.   Purpose and general description of generic CPAs
>>
The project activity aims at reducing the fuel wood consumption and indoor air pollution of traditional stove users in India by disseminating Improved Cook Stoves (ICS) of the type XXX at subsidized prices. Where improved wood gasifier cook stoves will be distributed, also 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.

SECTION B.   Application of a baseline and monitoring methodology and standardized baseline

B.1.   Reference of methodology(ies) and standardized baseline(s)
>>
The activity applies two small scale baseline and monitoring methodologies:

- AMS–II.G, version 07[8]: "Energy Efficiency Measures in Thermal Applications of Non-Renewable Biomass". This methodology will be applied in any case.

- AMS–III.BG, version 03[9]: "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.   Applicability of methodology(ies) and standardized baseline(s)
>>
Methodology AMS-II.G, version 07, "Energy Efficiency Measures in Thermal Applications of Non-Renewable Biomass" is applicable because the "category comprises appliances involving the efficiency improvements in the thermal applications of non-renewable biomass" (para. 1). Examples of these technologies and measures include the introduction of high efficiency biomass fired cook stoves or ovens or dryers and/or improvement of energy efficiency of existing biomass fired cook stoves or ovens or dryers." All ICS distributed under this PoA will be portable or in situ single or multi pot stoves that, will have a thermal efficiency of over 20%, demonstrated by an official water boiling test approved by a national certification body or manufacturer specifications meeting the

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[8]http://cdm.unfccc.int/methodologies/DB/KZ6FQOCEEHD1V02ARWTW1W2R9G45BX

[9]http://cdm.unfccc.int/methodologies/DB/MVOAXD3LGD4ZJEKEERCT39ZLJ3JZA0

requirements described in AMS-II.G, version 7, Para. 3. All ICS will replace existing traditional wood stoves; therefore, no greenfield installations are included.

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[10].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 (FRA2010) 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 at157milliontonnes or 235 million cu.m.[11]However, the production of firewood from forests estimated by FSI (Forest Survey of India) is only 40 million cu.m.[12]Thus, there was a gap of 195 million cu.m. in demand and production of firewood. Thus it is established that non-renewable biomass has been used in India since 31 December 1989, using official reports of the Government of India. Thus, it is clear from the above arguments that the wood resources in India are constrained with respect to extraction which has increase data much higher rate as compared to increase in forests (including outside forests/wooded land) and non renewable biomass extraction is prevalent since 1989.

The limit for applying AMS-II.G corresponds to 180 GWh of thermal energy savings, the CPA will not claim ER above this limit. The CPA includes the distribution of approximately XXX ICS, each of which is expected to save XXX tons of woody biomass annually, corresponding to total savings of XXX tons of woody biomass, corresponding to XXX TJ (applying the IPCC default value for wood fuel, 0.015 TJ/ton) or XXX GWh thermal.

During verifications the DOE will assess that the small scale limit (180 GWh thermal per CPAs) was not exceeded at any time for any CPA.

Methodology AMS–III.BG, version 03: "Emission reduction through sustainable charcoal production and consumption" is applicable for the generation of charcoal in micro gasifier stoves at household level and its supply to identified consumers included in the project boundary (para. 3 & 4). The CPA also applies AMS-II.G, which is a precondition for using AMS–III.BG with micro gasifier stoves. The project activity installs and operates new (greenfield) charcoal production facilities characterized by a new investment. No micro gasifier stoves are disseminated that require auxiliary power consumption in a blower or fan for forced convection. Methane produced during charcoaling process is gainfully used for heat (cooking).Users of charcoal may include (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 will not include large scale industries. Charcoal users will sign agreements stating that they will not claim ER for the use of the charcoal provided under this CPA.

The biomass used for charcoal production will be biomass used for cooking by households in micro gasifier stoves, without chemical handling or storage of more than one year.

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

[11]http://www.fsi.nic.in (page 46; section 3.7)

[12]http://www.fsi.nic.in (page 46; section 3.8)

In order to meet the corresponding small-scale limit of 60,000 tons of annual CO_2 reduction (CDM-EB65-A05-STAN vers. 09.0), the total amount of conventional charcoal to be replaced is limited to approximately 8,000 tons and the maximum ICS number to XXX.

During verifications, the DOE will assess that the small scale limit (60,000 tons of annual CO2 reduction per CPAs) was not exceeded at any time for any CPA.

Table summarizing applicability criteria:

Criterion	Justification of applicability
AMS-II.G, version 07	
2.1 Para. 2: "The category comprises appliances involving the efficiency improvements in the thermal applications of non-renewable biomass. Examples of applicable technologies and measures include the introduction of high efficiency biomass fired cook stoves..."	The purpose of the CPA is the distribution of improved cook stoves (ICS) consuming woody biomass, 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 request in footnote 1).
2.1 Para. 3: In the case of cook stoves, the methodology is applicable to introduction of single pot or multi pot portable or in-situ cook stoves with rated efficiency of at least 20 per cent.	ICS distributed under the CPA are portable single or multi pot stoves. The thermal efficiency surpasses 20%, as shown by a water boiling test meeting the requirements of para. 3 of AMS-II.G version 7. (For the Servals TLUD gasifier stoves, the MMSME (Ministry of Micro-, Small- and Medium Enterprises) certified a thermal efficiency of 36.9% (appendix 3 of the specific CPA-DD).
2.2 Para. 2: Non-renewable biomass has been used in the project region since 31 December 1989.	See justification in the text.
2.2 Para. 1. The small scale limit for AMS-II.G corresponds to 180 GWh thermal energy savings.	See justification in the text.
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 mico-gasifier stoves using biomass for cooking and not using auxiliary power in blowers or fans, such as the Servals TLUD(see section A.6 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	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)

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.	or (iii) as mentioned in Para. 4 of AMS-III.BG, excluding large-scale industries.
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.	Charcoal users will sign agreements stating that they will not claim ER for the use of the charcoal provided under this CPA.
Para. 6-9: Project activity, except for the case indicated in paragraph 3 above, shall ...	Not applicable since para. 3 is applicable; para. 6-9 refer to charcoal production in improved kilns, while the CPA is about charcoal generated in micro gasifier stoves.
Para. 10, 11: 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. 12: The embedded energy in charcoal produced as by-product in micro-gasifier stoves shall be neglected when performing water boiling test.	Charcoal produced is not considered for calculating stove efficiency, see sample WBT in appendix 3.
The small-scale limit for AMS-III.BG corresponds to 60,000 tons (CDM-EB65-A05-STAN vers09.0).	See justification in the text.

B.3.   Sources and GHGs

>>

Source		GHGs	Included?	Justification/Explanation
Baseline scenario	Cooking on traditional stoves with fuelwood	CO_2	Yes	Important source of emissions
		CH_4	No	Important source of emissions, but excluded for the sake of conservativeness, according to AMS-II.G.
		N_2O	No	Excluded for the sake of conservativeness.
	Use and production of conventional charcoal	CO_2	Yes	Important source of emissions
		CH_4	Yes	Included according to AMS-III.BG for traditional charcoal production, for the share of charcoal produced with biomass deemed renewable.
		N_2O	No	Excluded for the sake of conservativeness.
Project scenario	Cooking on traditional stoves with fuelwood	CO_2	Yes	Important source of emissions
		CH_4	No	Less relevant than in the baseline scenario, where it is also excluded.
		N_2O	No	Less relevant than in the baseline scenario, where it is also excluded.
	Use and production of	CO_2	Yes	Important source of emissions
		CH_4	No	According to AMS-III.BG, not considered since micro gasifier stoves use pyrolysis gas for heat generation for cooking.

	conventional charcoal	N_2O	No	Less relevant than in the baseline scenario, where it is also excluded

B.4. Description of baseline scenario

>>
As per AMS-II.G and version 07, 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.
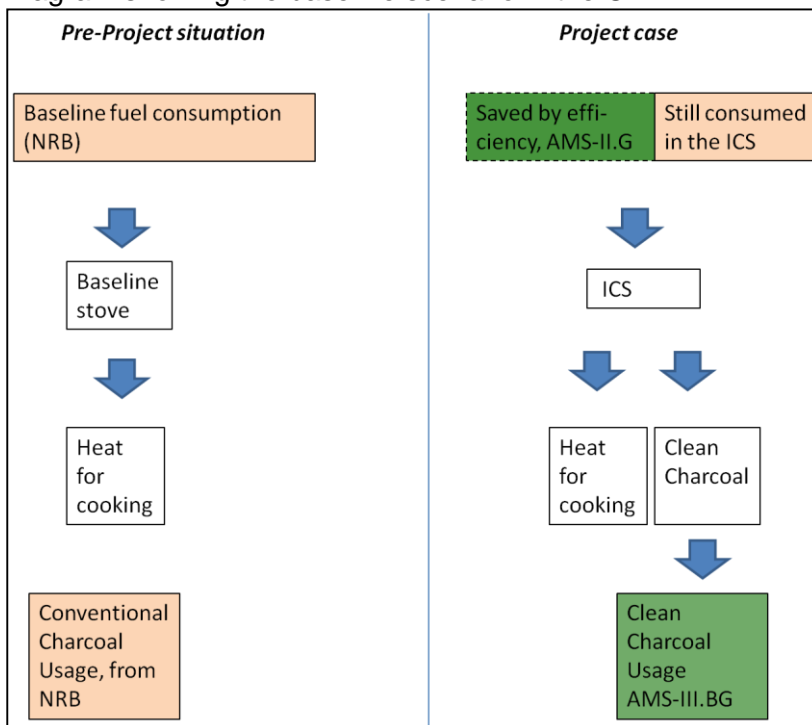
Regarding the efficiency component (AMS-II.G), the vast majority of the population in the project area uses fuel wood in traditional stoves, without improved combustion air supply, grate or chimney, to reach their thermal energy needs. The target population of the project consists only in fuelwood users, 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 showing the baseline scenario in the CPA

B.5 Demonstration of eligibility for a generic CPA

Nr	Eligibility Criteria		Mean of proof / Evidence Document (to be checked at CPA inclusion)
	Category	Description	
1	Ref: EB 87, Annex 3Par.18(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.7, specifying location and boundary of the CPA Additionally, a statement from CPA operator/CME that the boundary is within India.
2	Ref: EB 87, Annex 3 Par.18 (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 B/D.7.2, describing the unique ICS numbering system for this CPA.
3	Ref: EB 87, Annex 3 Par.18 (c): 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.5, 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.
4	Ref: EB 87, Annex 3 Par.18 (d): 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 23/05/2014.	Evidence for inclusion: CPA-DD section A.8.1, specifying the CPA start date. Moreover, evidence on the CPA start date will be provided to the DOE.
5	Ref: EB 87, Annex 3 Par.18 (e): Conditions that ensure compliance with applicability and other requirements of	For all CPAs that will be included in this PoA, the use of multiple methodologies (AMS-II.G version 07 and AMS–III.BG. version 03) shall be justified.	Document: CPA-DD, section B.2/D.2. Evidence for the applicability of specific methodologies described below.

	single or multiple methodologies applied by CPAs	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.5, 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.
6	Ref: EB 87, Annex 3 Par.18 (f): The conditions that ensure that the CPA meets the requirements pertaining to the demonstration of additionality	Additionality is demonstrated as described in detail in Section B.1 of the PoA DD, applying paragraph 11. (c) of EB 83Annex 14; and making reference to the debundling check which applies even stricter criteria.	Evidence for inclusion: CPA-DD section A.12, showing that the CPA passes the debundling check. Moreover, evidence on the energy savings and thermal capacities of ICS types used.
7	Ref: EB 87, Annex 3 Par.18 (g): The PoA-specific requirements stipulated by the CME including any conditions related to undertaking local stakeholder consultations and environmental impact analysis	The local stakeholder consultation will be conducted at the PoA level (Section F of the PoA-DD). 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 with a boundary reaching outside West Bengal, or - A CPAs is included applying another stove technology than the Servals TLUD, or - A CPA is implemented by another institution than the CME An environmental impact analysis is not required (section E.2 of the PoA-DD).	Evidence for inclusion: Check of documentation of stakeholder consultation, CPA-DD section C, in cases where: - A CPA is included with a boundary reaching outside West Bengal, or - A CPAs is included applying another stove technology than the Servals TLUD, or - A CPA is implemented by another institution than the CME
8	Ref: EB 87, Annex 3 Par.18 (h):	The CME and the CPA operator (in case of being different from the	Evidence for inclusion:

	Conditions to provide an affirmation that funding from Annex I Parties, if any, does not result in a diversion of official development assistance	CME) shall confirm that in case of public funding, there is no diversion of Official Development Assistance.	Statement of CME and the CPA operator (in case of being different from the CME) on use of ODA (appendix 2). In case of ODA involved in funding or pre-funding parts of a CPA, a confirmation that no diversion of ODA occurs will be provided.
9	Ref: EB 87, Annex 3 Par.18 (i): 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 regional partners such as the Sapient Infotech (Sapient).	Evidence for inclusion: CPA-DD section A.5, 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.
10	Ref: EB 87, Annex 3 Par.18 (j): 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 including all annexes and amendments till EB 86Annex 03.	Evidence for inclusion: CPA-DD section B/D.7.2, describing the sampling plan. In case the CPA is not implemented by the CME itself, an agreement will be signed with the CME defining responsibilities and duties of the implementing agent.
11	Ref: EB 87, Annex 3 Par.18 (k): Where applicable, the conditions that ensure that every CPA (in aggregate if it comprises of independent sub units) meets the small-scale or microscale threshold and remains within those thresholds throughout the crediting period of the CPA	The CPA will remain under the applicable SSC limits for each component: For AMS-II.G: Threshold of 180 GWh/a thermal energy savings (threshold as per clarification request SSC_233) for all ICS distributed under the CPA. For AMS–III.BG: Threshold of total ER of 60,000 t CO2e per year, for the total amount of charcoal provided to charcoal users.	Evidence for inclusion: CPA-DD section B.2/D.2 and the ER calculation spreadsheet in appendix 3, calculating, in relation to the SSC limits - the estimated maximum number of ICS to be distributed - the estimated maximum amount in total of charcoal to be provided to charcoal users and, During verifications the DOE will assess that the small scale limits were not exceeded at any time for any CPA. Additional evidence: Stove producer's specifications on stove capacity.
12	Ref: EB 87, Annex 3 Par.18 (l): Where applicable, the requirements for the debundling check, in case the CPAs belongs to small-scale or microscale project categories.	If each of the independent subsystems/measures included in the CPA of a PoA is no larger than 1% of the small-scale thresholds defined by the methodologies applied, then the is exempted from performing de-bundling check (EB 83, annex 13).	Evidence for inclusion: CPA-DD, section A.12, showing that each ICS distributed under the CPA is clearly below 1% of each of the relevant SSC thresholds. Additional evidence: Stove producer's specifications on stove capacity.

		1% of SSC limits correspond to energy savings of 1.8 GWh or ER of 600t CO_2 annually.	
13	Approval of CPA by CME	The CME approves each CPA to be included into its registered PoA.	Evidence for inclusion: Statement of CME giving approval for the CPA to be included into its registered PoA.
14	CER ownership	End users receiving ICSs under the specific CPA as well as charcoal users receiving charcoal from the CPA contractually cede their rights to claim and own emission reductions under the Clean Development Mechanism of the UNFCCC to the CME of the PoA.	Evidence for inclusion: A default sales agreement for end users including the provision that emission reductions generated by the stove are owned by the CME will be provided for each CPA.
15	Awareness and agreement of those operating a CPA on PoA subscription	Contractual provisions to ensure that those operating the CPA are aware and have agreed that their activity is being subscribed to the PoA.	Evidence for inclusion, in case CPA operators are different from the CME: A declaration from CPA operators, stating that they are aware and have agreed that their activity is being subscribed to the PoA will be provided for each CPA.

B.6. Estimation of emission reductions of a generic CPA

B.6.1. 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 2)

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

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

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. 11:

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

(equation 2)

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_2e
$ER_{y,i,j}$	Emission reductions by project device of type i *and* batch j during year y in t CO_2e

and   equation (3)

$$ER_{II.G,y,i,j} = B_{y,savings,i,j} \times N_{y,i,j} \times \frac{\mu_{y,i,j}}{365} \times f_{NRB,y} \times NCV_{biomass} \times EF_{projected\_fossil\,fuel}$$

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 (fNRB) values available on the CDM website.
$NCV_{biomass}$	=	Net calorific value of the non-renewable woody biomass that is substituted (IPCC default for wood fuel, 0.015 TJ/tonne, based on the gross weight of the wood that is 'air-dried')
$EF_{projected\_fossilfuel}$	=	Emission factor for the fossil fuels projected to be used for substitution of non-renewable woody biomass by similar consumers. Use a value of 81.6 t CO2/TJ
$N_{y,i,j}$	=	Number of project devices of type *i* and *batch j* operating during year *y*,
$\mu_{y,i,j}$	=	Number of days of utilization of the project device *i* and batch *j* during the year *y*.
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 365, following the final response of the SSC-WG on request 713, stating that It may be set to 1 (365/365) if the number of days for which the project stove's operation does not face any constraint. (Moreover, since since AMS-II.G vers. 07 equation 7 is applied, ER are based on the woody biomass used in the project devices which is monitored accurately anyways).

$B_{y,savings,i,j}$ 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 17, WBT) is chosen, with the corresponding formula (equation 7 of AMS-II.G version 7):

(equation 4)

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

Where:

$B_{y=1,new,i,survey}$	=	Quantity of woody biomass used by project devices in tonnes per device of type *i*.
$\eta_{old,i,j}$	=	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 $\eta_{new,i,j}$ if this charcoal will be used outside the ICS, according to AMS–III.BG.

As specified under B.7.1, $B_{y=1,new,i,survey}$ may be monitored directly or it may be calculated based on average weekly fillings ($fillings_{i,y=1}$) and the average load of a batch-fed ICS ($load_{i,y=1}$).

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

(equation 5)

$$ER_{II.G,y} = \sum_i \sum_j B_{y=1,new,i,survey} \times \left(\frac{\eta_{new,i,j}}{\eta_{old,i,j}} - 1 \right) \times 0.95 \times N_{y,i,j} \times \frac{\mu_{y,i,j}}{365} \times f_{NRB,y} \times NCV_{biomass} \\ \times EF_{projected\_fossil\ fuel}$$

Determination of the Share of Non-Renewable Biomass
According to AMS II.G, par. 28, equation 9, the following equation shall be used to calculate f_{NRB}:

(equation 6)

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

where:
  $f_{NRB,y}$ fraction of non-renewable biomass (%)
  NRB: non renewable biomass (tons)
  DRB: Demonstrably renewable biomass (tons)

f_{NRB} will be calculated for each CPA.

Leakage

According to AMS-II.G the following potential sources of leakage have to be considered:

A) Use of NRB savings by non-project households

According to AMS-II.G para. 28 the default net to gross adjustment factor of 0.95 is applied to account for leakage and therefore surveys are not required.

B) Transfer of Equipment

"If equipment currently being utilised is transferred from outside the boundary to the project activity, leakage is to be considered."

This leakage source can be ruled out since no used improved cook stoves will be transferred or deployed from outside the geographical project boundary to the project activity.

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)

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

Where:

$ER_{III.BG,y}$	=	Emission reductions in year y[13] (t CO_2e/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)
$GWP_{CH4,y}$	=	Global warming potential of methane applicable to the crediting period (t CO_2e/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

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[13] Project emissions on account of transport are assumed to be negligible.

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)

$$PE_{y,fugitive} = \sum_i Q_{CCP,iy} \times GWP_{CH4,y} \times SMG_{y,b} \times f$$

Where:

$PE_{y,fugitive}$ = Fugitive emissions from operation of charcoal producing facility (physical leakage) in the year y (t CO_2e)

f = A fraction attributed to project charcoal production technology, use a default value of 0.1.

Equations 7 and 8 can thus be combined and simplified:

(equation 9)

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

$f_{NRB,y}$ is determined as described in this section B.6.1 under AMS-II.G.

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

B.6.2. Data and parameters fixed ex-ante

>>

Data / Parameter:	μ_y
Data Unit:	#
Description:	Number of days of utilization of the ICS during the year '*y*'.
Source of data:	AMS-II.G, version 07, and final response of the SSC WG on request 713.
Value(s) applied:	365
Choice of data or Measurement methods and procedures:	μ_y is set to 365, following the final response of the SSC-WG on request 713, stating that it may be set to 1 (365/365) if the number of days for which project stoves operation does not face any constraint. (Moreover, since equation 7 of AMS-II.G version 7 is applied, ER are based on the woody biomass used in the project devices which is monitored accurately anyways).
	In the case where the efficient project stove was operated only for a part of the year due to logistics of the stove distribution during the initial phase of the project implementation, as also mentioned in final response of the SSC-WG on request 713, the provisions for monitoring of parameter $N_{y,i,j}$ in section B.7.1 guarantee that only the real operation time is considered.
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 07, default value
Value(s) applied:	0.10
Choice of data or Measurement methods and procedures:	According to AMS II.G, ver. 7, Table 14, 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.
Purpose of data:	Calculation of baseline emissions
Additional comment:	

Data / Parameter:	NCV_{wood} or $NCV_{biomass}$
Data Unit:	TJ/tonne
Description:	Net calorific value of the non-renewable woody biomass that is substituted
Source of data:	AMS-II.G, version 07, default value
Value(s) applied:	0.015
Choice of data or	This is the IPCC default value for wood fuel as provided by AMS II.G version 07, par.11

Measurement methods and procedures:	
Purpose of data:	Calculation of baseline emissions
Additional comment:	

Data / Parameter:	$NCV_{charcoal,default}$
Data Unit:	GJ/tonne
Description:	Default net calorific value of charcoal
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:	$f_{NRB,y}$
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:	The value will be defined in each CPA. For preliminary calculations, a value of 96.24% is applied (value for West Bengal)
Choice of data or Measurement methods and procedures:	See B.6.1
Purpose of data:	Calculation of baseline emissions
Additional comment:	

Data / Parameter:	$EF_{projected\_fossilfuel}$
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 07, default value under para. 11.
Value(s) applied:	81.6
Choice of data or Measurement methods and procedures:	Default value as provided by AMS II.G version 07, par.11
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 07, para 28, $B_{y,savings,i,j}$ 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_2e/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.6.3. Ex-ante calculations of emission reductions

>>
Emission reductions are calculated by summarizing ER from all three components (see *equation 1*)

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

(equation 5)

$$ER_{II.G,y} = \sum_i \sum_j B_{y=1,new,i,survey} \times \left(\frac{\eta_{new,i,j}}{\eta_{old,i,j}} - 1\right) \times 0.95 \times N_{y,i,j} \times \frac{\mu_{y,i,j}}{365} \times f_{NRB,y} \times NCV_{biomass}$$
$$\times EF_{projected\_fossil\,fuel}$$

The only parameters that are not determined ex-ante are $B_{y=1,new,i,survey}$, $\eta_{new,i,j}$ and $N_{y,i,j}$, which are monitored or calculated from monitored values (see B.7.1).

$\left(\frac{\eta_{new,i,j}}{\eta_{old,i,j}} - 1\right)$ 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.7.1)

$B_{y=1,new,i,survey}$ is preliminarily fixed as 1.6 t/a (see B.7.1). Cases where households do not use their ICS will be considered as drop-out. No drop-out is assumed for preliminary calculations.

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

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

$Q_{CCP,i,y}$ will be monitored, it is preliminarily set to 320kg (20% of $B_{y=1,new,i,survey}$) per ICS. $NCV_{charcoal}$ will also be monitored, it is preliminarily set to 29.5 GJ/t. All other parameters are fixed ex-ante.

We assume a value of 1.6 tons (see B.7.1) of fuelwood per stove for $B_{y=1,new,i,survey}$.

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	$B_{y=1,new,i,survey}$	Monitored	tons/a	1.60
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	%	20.0%
C	η_{old} (efficiency of replaced stove)	AMS-II.G default	%	10%
D	L_y: Discount for leakage	AMS-II.G and AMS-I.E default		0.95
E	$B_{y,savings,i,j}$ per stove	A * ((B/C) - 1) * D	tons/a	1.52

F	f_{NRB}: fraction of non-renewable biomass	NRB/(NRB+DRB), preliminary value for West Bengal	%	96.24%
G	$EF_{projected\_fossilfuel}$	AMS-II.G default	tCO2/TJ	81.60
H	$NCV_{biomass\ or\ wood}$	AMS-II.G default	TJ/t	0.015
$ER_{II.G}$ **per ICS**		$E*F*G*H$	**tons/a**	**1.79**

J	$Q_{CCP,i,y}$:Quantity of charcoal produced and used	Monitored, preliminary value 20% of $B_{y,new,survey,y}$ per stove	tons	0.32
K	CF: Conversion factor wood to charcoal	AMS-II.G defautls, IPCC guidelines		6
L	$NCV_{charcoal}$ / $NCV_{charcoal,default}$	Monitored, prelim. set 1		1
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		$J*((K*I*L*G*H)+(M*(0.9-G)*N))$	tCO2/a	**2.25**

Possible total ER per ICS	**tCO2/a**	**4.04**

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

B.7. Application of the monitoring methodology and description of the monitoring plan

B.7.1. Data and parameters to be monitored by each generic CPA

Data / Parameter:	$B_{y=1,new,i,survey}$
Data Unit:	t/year
Description:	Quantity of woody biomass used by project devices in tonnes per device of type i.
Source of data:	Survey on $fillings_{y=1}$ and $load_{y=1}$ as described below.
Value(s) applied:	For ex-ante calculations: 1.6 tons annually per ICS, based on approximately 28weekly loads of approximately 1.1kg each, taken from a pilot project.
Measurement methods and procedures:	$B_{y=1,new,i,survey} = = fillings_{y=1,i} * load_{y=1,i} * 0.052$ (conversion factor to from kg /week to t/a) $fillings_{y=1,i}$: Average number of weekly fillings of a batch-loaded ICS type i in the first year A representative sample of randomly selected users will be 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. Where ICS are found not to be operational during monitoring, they will not considered here. $load_{y=1,i}$: Average amount of fuelwood used per filling of an ICS type i in the first year The average weight of a ICS fuelwood load will be determined as the average value obtained over all WBTs that are conducted to determine $\eta_{new,i,j}$. Most probably, the data from these WBTs will be sufficient to achieve the required precision, since the sample size for $\eta_{new,i,j}$ is expected to be larger than for $load_{y=1,i}$. If additional data are needed, they will be obtained by asking additional randomly selected users to start a normal cooking session and determining the weight of the filling. Alternatively, $B_{y=1,new,i,survey}$ may be monitored directly in cases where biomass is directly provided to the ICS users by the CPA implementer. Determined in the first year of the introduction of the devices (e.g. during the first year of the crediting period, y=1) through a sample survey including a measurement campaign (see B.7.1): For batch-loaded micro gasifier ICS, the amount of fuelwood used can be determined by measuring the average amount of fuelwood used per filling in a representative survey and asking the users to specify the number of fillings for each meal and the days of usage per week. Moreover, as mentioned in condition b), the sample survey clearly distinguishes the quantity of biomass used by the project device; it cannot be confused with biomass consumed in a baseline stove that may still be continued to use.
Monitoring frequency:	Only in the first year of the crediting period.

QA/QC procedures:	It will be assured that all requirements of the sampling plan of the CPA are met.
	Cross checks will be performed to confirm the plausibility of data obtained with cooking habits and the amount of charcoal collected from ICS users.
Purpose of data:	Calculation of baseline emissions
Additional comment:	

Data / Parameter:	$\eta_{new,i,j}$
Data Unit:	%
Description:	Efficiency of the device of each type *i and batch j* implemented as part of the project activity, calculated without accounting for the remaining charcoal
Source of data:	Primary data collection during monitoring campaigns by dedicated monitoring team based on WBT.
	The efficiency of the project devices was confirmed by the testing center of the Ministry of Micro, Small & Medium Enterprises.
	Efficiency losses will be monitored according to AMS-II.G version 07 para 21 c.;
Value(s) applied:	Monitored, assumption for Ex-Ante Emission Calculation: 20%
Measurement methods and procedures:	Adjustment of $\eta_{new,i,j}$ due to efficiency loss will be monitored according to AMS-II.G version 07 para 21 c.
	The efficiency of the project devices of the first batch 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.
	The rate of loss in efficiency will be applied correspondingly to all batches.
	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. 07, par. 64.
Purpose of data:	Calculation of baseline emissions
Additional comment:	

Data / Parameter:	$N_{y,i,j}$
Data Unit:	Number
Description:	Adjusted total number of ICS of type i and 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: 1
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 project device i) and the end of the monitoring period will be considered. Therefore, $N_{y,i,j}$ will include an adjustment factor by applying the following formula: $$N_{y,i,j} = Nsoldtotal_{y,i,j} * d_{average,y} / mplength_y$$ Where: $Nsoldtotal_{y,i,j}$ total number of ICS type i and 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 $mplength_y$ 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:	

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
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.7.2. Interviews will be reported in a questionnaire.
Monitoring frequency:	The CME 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 fuelwood consumed in micro gasifier stoves based on preliminary WBT.

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 based on the exact weight but on the number of bags delivered, the following formula will apply: $Q_{CCP,i,y} = weightbags_{y,i} * nbags_{y,i}$ Where: $weightbags_{y,i}$ average weight of bags of charcoal type i in period y $nbags_{y,i}$ total number of bags of charcoal type i in period y $nbags_{y,i}$ will be determined based on invoices/receipts of charcoal buyers. $weightbags_{y,i}$ will be determined on sample basis in accordance with the sampling standard. Simultaneously, it will be checked that charcoal buyers are eligible according to para. 4 of AMS-III.BG version 05.
Monitoring frequency:	In batches, depending on the deliveries to charcoal buyers or retailers
QA/QC procedures:	The entire chain of charcoal collection will be documented, demonstrating how the amount of charcoal delivered to users of conventional charcoal relates to the amount generated by users. There will be cross checks with: - total quantity of charcoal generated by the micro gasifiers based on monitored fuelwood consumption and the observed conversion-rate to charcoal. - the average amounts of charcoal collected from stove users based on records of field assistant collecting charcoal
Purpose of data:	Calculation of baseline emissions
Additional comment:	-

Data / Parameter:	$NCV_{charcoal}$
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, appendix 1, deemed value
Value(s) applied:	Preliminary value: 29.5 (default given in AMS–III.BG for conventional charcoal)

Measurement methods and procedures:	Monitored once during the first year of the crediting period. Measurement is undertaken in laboratories according to relevant national/international standards. Measure quarterly, taking at least three samples for each measurement. Samples will be taken from the stocks of charcoal collected from users before selling it to charcoal users/retailers. The average value will be used for the rest of the crediting period provided that there is no change in the biomass types used for charcoal i production.
Monitoring frequency:	Quarterly during the first year of the crediting period
QA/QC procedures:	Charcoal generated from other than purely woody sources will not be accepted by users of conventional charcoal since it will not be comparable to conventional charcoal. The consistency of the measurements will be checked by comparing the measurement results with relevant data sources (e.g. values in the literature, values used in the national GHG inventory) and default values by the IPCC. If the measurement results differ significantly from previous measurements or other relevant data sources, additional measurements will be conducted and/or justification will be provided.
Purpose of data:	Confirm applicability of way of calculation of baseline emissions
Additional comment:	

B.7.2. Description of the monitoring plan for a generic CPA

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 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 to ensure completeness and accuracy of monitoring information. The basic information for ICSs distributed to households will be[14]:

- 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 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.7.1, thus no sampling is necessary: $N_{y,i,j}$, $NCV_{charcoal}$ and possibly $Q_{CCP,i,y}$ (where possible). For monitoring $NCV_{charcoal,i}$, only three samples will be drawn, therefore the sampling standad is not applicable. 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

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[14]The record keeping system should collect as many information as necessary to facilitate the Verification of the CERs. At the current point of time the list of information seems ideal but may be extended or condensed. The collection of all the items is therefore not mandatory and additional information may be collected as well.

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:

- $\eta_{new,i,j}$
- $fillings_{y=1,i}$
- $load_{y=1,i}$

The latter two parameters will be used to determine $B_{y=1,new,i,survey}$

- $weightbags_{y,i}$ (where applicable, used to determine $Q_{CCP,i,y}$)

Different sample sizes can be selected for each of these parameters

$DO_{II.G,y}$, $\eta_{new,i,j}$, $fillings_{y=1,i}$ and $load_{y=1,i}$ 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).

4. **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 $DO_{II.G,y}$, $\eta_{new,i,j}$, $fillings_{y=1,i}$ and $load_{y=1,i}$ (the latter two parameters in order to determine $B_{y=1,new,survey}$).

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 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.6.2. of the this CPA-DD).

      iv. Sampling requirements as per sampling standard and applicable methodology

Precedence of methodology

Par. 9of the Sampling Standard, EB 50 Annex 30 STAN, version 05.0 clarifies that *"[…] any requirements specified in the applicable methodologies having precedence"*.

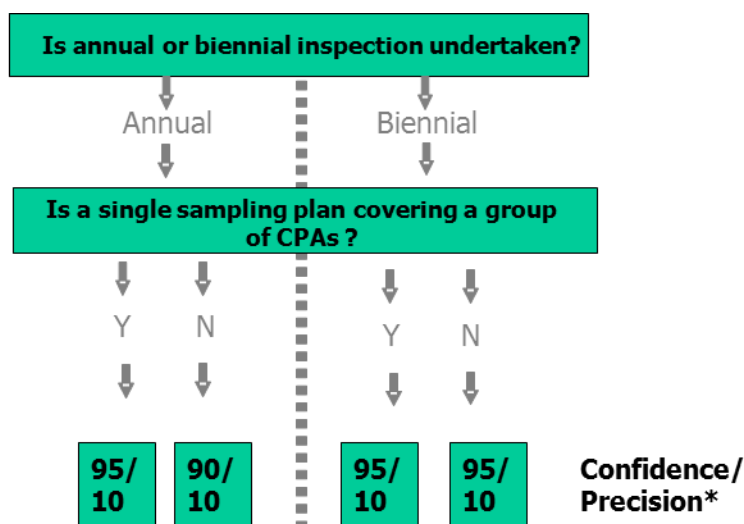Coverage of sampling requirements in the applicable methodology:

As per applicable methodology AMS-II.G ver. 7. par. 36, *"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 05.0.

> v. Confidence/precision criteria to be met

As mentioned above, according to AMS-II.G ver. 7, par. 36, confidence/precision criteria to be met is determined as follows:

*due to methodology precedence

Note: As per par. 36 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 $DO_{II.G,y}$, $\eta_{new,i,j}$, $fillings_{y=1,i}$ and $load_{y=1,i}$, 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 , 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. Also multi-stage sampling may be applied if deemed suitable by the CME. 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 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$_{ll.G,y}$** and **fillings$_{y=1,i}$**. For the monitoring of $\eta_{new,i,j}$ and **load$_{y=1,i}$**, that 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
$fillings_{y=1,i}$	xxx	xxx	xxx	xxx
$load_{y=1,i}$	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: $DO_{ll.G,y}$

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

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 $B_{y=1,new,i,survey}$, $\eta_{new,i,j}$, $fillings_{y=1,i}$, $load_{y=1,i}$
($weightbags_{y,i}$- see cluster sampling)

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

Where:

V $\left(\dfrac{SD}{mean}\right)^2$

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
$DO_{II.G,y}$	Biennial and/or across CPA	95/10	xxx	xxx	xxx	xxx
$fillings_{y=1,i}$			xxx	xxx	xxx	xxx
$load_{y=1,i}$			xxx	xxx	xxx	xxx
$\eta_{new,i,j}$			xxx	xxx	xxx	xxx
$DO_{II.G,y}$	one CPA, annual	90/10	xxx	xxx	xxx	xxx
$fillings_{y=1,i}$			xxx	xxx	xxx	xxx
$load_{y=1,i}$			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 $DO_{II.G,y}$, will be chosen for the sampling effort with one common survey for all parameters. For the monitoring of all other parameters, a random sub-samples from the common sample will be drawn according to the calculated sample size of the parameter.

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

Cluster Sampling

Cluster sampling may be applied in order to determine the average size of charcoal bags, **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:

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

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:

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

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 | Z value for confidence level (e.g. 1.645 for 90% confidence level, 1,96 for 95% confidence interval) |

The framework for calculation of c for the parameter $DO_{II.G,y}$ 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
$\bar{N}$ *	$(N_A+ N_B+ N_C + N_D+…)/M$		
$\bar{}$ *		$(pA+pB+pC+pD+…)/ M$	
$SD_B{}^{2}$*		See below	
$SD_W{}^{2}$*			See below
M (number ofclusters)	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 (ū), different sample sites for c will result:

Example results table with input parameter u

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

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

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

Step 2.:

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

e. Sampling Frame
    i. Identification or description of sampling frame

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

For the monitoring parameter $weightbags_{y,i}$, 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 (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

5. **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
$DO_{II.G,y}$	$DO_{II.G,y}$	Statistically adjusted drop out from total population of appliances in period y
$B_{y=1,new,i,survey}$	$fillings_{y=1,i}$	Average weekly fillings of the ICS
	$load_{y=1,i}$	Average load of the ICS per canister filling
$\eta_{new,i,j}$	$\eta_{new,i,j}$	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

$DO_{II.G,y}$: 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 is use over the entire period. Due to this conservative approach, seasonal effects will have no impact on the final result.

$fillings_{y=1,i}$ and $load_{y=1,i}$: No seasonal effects are expected for meal preparation, since the quantity of food prepared is independent from seasonal effects. There may be increased use of the ICS for other purposes such as boiling water in the monsoon season. Such other uses than cooking of daily food are conservatively not considered, by asking specifically for usage for meal preparation.

$\eta_{new,i,j}$: 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

$DO_{II.G,y}$: 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.

$fillings_{y=1,i}$ is determined by asking users for the average number of weekly loads of fuelwood burnt in their ICS, assigning them to specific meals, and days of usage per week.

$load_{y=1,i}$ is determined as the average weight of a ICS fuelwood load will be determined by applying the average value obtained over all WBTs that are conducted to determine $\eta_{new,i,j}$. As shown in the table on expected sample sizes for random sampling in this section, the expected sample size for the latter parameter is bigger than for $load_{y=1,i}$.

The latter two parameters are used to calculate $B_{y=1,new,i,survey} = fillings_{y=1,i} * load_{y=1,i} * 0.052$

$\eta_{new,i,j}$ 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 112.

$weightbags_{y,I}$ 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

CME will apply the "3 sigma rule": 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 is responsible for preparing the Monitoring Report.

6. **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.

Appendix 1.   Contact information of coordinating/managing entity and responsible person(s)/ entity(ies)

CME and/or responsible person/ entity	☒ CME ☐ Responsible person/ entity for application of the selected methodology(ies) and, where applicable, the selected standardized baseline(s) to the PoA
Organization	Servals Automation Pvt. Ltd..
Street/P.O. Box	No. 5/1, Balaji Nagar, 1 Street
Building	Ekkattuthangal
City	Chennai
State/Region	Tamil Nadu
Postcode	600032
Country	India
Telephone	+91 44 64577181
Fax	
E-mail	sujatha@servals.in
Website	
Contact person	Sujatha Srinivasan
Title	Director
Salutation	
Last name	Srinivasan
Middle name	
First name	Sujatha

CME and/or responsible person/ entity	☐ CME ☒ Responsible person/ entity for application of the selected methodology(ies) and, where applicable, the selected standardized baseline(s) to the PoA
Organization	atmosfair gGmbH
Street/P.O. Box	Zossener Strasse 55-58
Building	Aufgang D – 6. OG
City	Berlin
State/Region	Berlin
Postcode	10961
Country	Germany
Telephone	+49 30 627 3550-0
Fax	+49 30 627 3550-29
E-mail	info@atmosfair.de
Website	www.atmosfair.org
Contact person	Katrin Mikolajewski
Title	CDM Project developer
Salutation	Dr.
Last name	Mikolajewski
Middle name	

CME and/or responsible person/ entity	☐ CME ☒ Responsible person/ entity for application of the selected methodology(ies) and, where applicable, the selected standardized baseline(s) to the PoA
	Katrin

Appendix 2.   Affirmation regarding public funding

ODA declaration

Appendix 3.   Applicability of methodology(ies) and standardized baseline(s)

Certificate on TLUD stove efficiency

Appendix 4.   Further background information on ex ante calculation of emission reductions

ER calculation spreadsheet in a separate file

Appendix 5.   Further background information on the monitoring plan

Calculation of sample sizes

Appendix 6.   Summary of post registration changes

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Document information

Version	Date	Description
04.0	9 March 2015	Revisions to: • Include provisions related to choice of start date of PoA; • Include provisions related to delayed submission of a monitoring plan; • Provisions related to local stakeholder consultation; • Add exception for generic CPA where technology is under positive lists; • Editorial improvement.
03.0	25 June 2014	Revisions to: • Include the Attachment: Instructions for filling out the programme design document form for small-scale CDM programme of activities (these instructions supersede the "Guideline: Completing the programme design document form for small-scale CDM programme of activities" (Version 03.0)); • Include provisions related to standardized baselines; • Add contact information on a responsible person(s)/ entity(ies) for the application of the methodology (ies) to the PoA in B.4 and 0; • Add general instructions on post-registration changes in paragraphs 2 and 3 of general instructions and **Fehler! Verweisquelle konnte nicht gefunden werden.**; • Change the reference number from *F-CDM-SSC-PoA-DD* to *CDM-SSC-PoA-DD-FORM*; • Editorial improvement.
02.0	13 March 2012	EB 66, Annex 13 Revision required to ensure consistency with the "Guidelines for completing the programme design document form for small-scale CDM programmes of activities".
01.0	27 July 2007	EB33, Annex43 Initial adoption.

Decision Class: Regulatory
Document Type: Form
Business Function: Registration
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