<table>
<tr>
<td></td>
<td align="center">**Programme design document form for
small-scale CDM programmes of activities**

(Version 04.0)</td>
</tr>
</table>

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.

<table>
<tr><td align="center">**PROGRAMME DESIGN DOCUMENT (PoA-DD)**</td></tr>
<tr><td>**Title of the PoA:** Project Gaia Cook Stove Programme of Activities (PoA)</td></tr>
<tr><td>**Version number of the PoA-DD:** Version 01</td></tr>
<tr><td>**Completion date of the PoA-DD: 15/10/2015**</td></tr>
<tr><td>**Coordinating/ managing entity:** Project Gaia Inc.</td></tr>
<tr><td>**Host Party(ies):** Ethiopia (host)

Djibouti (host)</td></tr>
<tr><td>**Sectoral scope(s) and selected methodology(ies), and where applicable, selected standardized baseline(s)** Sectoral Scopes: Energy industries renewable/non-renewable sources (1)

Selected Methodologies:

AMS-I.E *Switch from non-renewable biomass for thermal applications by the user* version 6.0 and AMS-I.I *Biogas/biomass thermal applications for households/small users* version 4.0

No Standardized baseline has been selected for this PoA</td></tr>
</table>

PART I.   Programme of activities (PoA)

SECTION A.   General description of PoA

A.1.   Title of the PoA

Title: Project Gaia Cook Stove Programme of Activities
Version: Version 01
Completion Date: 15/10/2015

A.2.   Purpose and general description of the PoA

The purpose of the Project Gaia Cook Stove Programme of Activities hereinafter referred to as "PG PoA" is the dissemination of clean and efficient cook stoves powered by renewable energy to households/communities/SMEs that previously used non-renewable biomass and/or fossil fuel. The programme will achieve emission reductions through the displacement of non-renewable biomass and kerosene use for cooking purposes.

Today, an estimated 2.5 billion people, or about one-third of the world's population, rely on biomass fuel for cooking.[1] About 600 million of these people live in sub-Sahara Africa where access to modern fuels is as low as 17%.[2] Biomass use in these developing economies is dominated by wood fuel in the primary form of charcoal and firewood.[3] The combustion of these fuels in open fires and energy inefficient stoves is the main source of greenhouse gas (GHG) emissions. Furthermore, the exposure to indoor air pollution from the traditional open fires and conventional cook stoves causes pneumonia, chronic respiratory disease, and lung cancer[4] causing an estimated 1.6 million deaths each year.

According to the briefing by the Scientific Advisory Panel and the Climate and Clean Air Coalition to reduce Short-Lived Climate Pollutants, kerosene is also considered as an important household fuel that is widely used in developing economies for lighting and to a lesser degree, for cooking.[5] In addition to the being a significant source of GHG, kerosene is reported to be responsible for a number of diseases such wheeze, rhinitis and phlegm.[6]

The PoA will involve the dissemination of energy efficient cook stoves powered by renewable sources of biomass (e.g. ethanol) to households/communities/SMEs. The CME will either distribute the stoves or work with various CPA implementers in distribution of the stoves to the specified end-users.

Further information on the technology applied under the PoA is provided in section A.6 of the PoA-DD.

Framework for the implementation of the proposed PoA

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[1] International Energy Agency, World Energy Outlook 2009 (Paris: Organisation for Economic Co-operation and Development, 2009), iea.org/textbase/nppdf/free/2009/weo2009.pdf.

[2] Joint United Nations Development Programme and World Health Organization Study (2009) on energy access situation in developing countries.

[3] Food and Agriculture Organization: Forests and Energy, Rome: FAO. (2008)

[4] Eva Rehfuess, Fuel for Life: Household Energy and Health (Geneva: World Health Organization, 2006), who.int/indoorair/publications/fuelforlife.pdf

[5] Scientific Advisory Panel Briefing: Kerosene Lamps & Slcps

Scientific Advisory Panel Briefing: Kerosene Lamps & Slcps

Project Gaia Inc. hereinafter referred to, as "Project Gaia" will act as the Coordinating/Managing Entity (CME) for the PoA. The CME will be responsible for:

- Development of the PoA Design Document (CDM-PoA-DD) and CDM Component Project Activity (CPA) Design Documents (CDM-CPA-DD) for CPAs that are developed under the Programme of Activities;
- Obtaining a Letter of Approval for the implementation of the PoA from the host country;
- Obtaining a Letter of Authorization for the coordination of the PoA from the host country;
- Liaise with the Designated National Authority (DNA) on matters related to the implementation of the PoA and inclusion of CPAs;
- Carry out a quality check on CPAs to be included in the Programme of Activities ensure that the CPA meets all the eligibility criteria as formulated in the PoA-DD;
- Collect and compile monitoring records from all the CPA entities;
- Coordinate monitoring activities and data management during the lifetime of the PoA;
- Contract a DOE for validation and verification purposes;
- Prepare and submit monitoring reports and facilitate the verification of the same;
- Act as the focal point with the CDM Executive Board for matters related to the PoA;
- During the lifetime of the PoA, maintenance of all monitoring reports of all CPAs in accordance with record keeping systems outlined in the CDM-PoA-DD.

CPA entities will be responsible for the implementation of individual CPAs under the PoA and will:

- Ensure that the described CPA is implemented;
- Operate and maintain the CPA for the duration of the project;
- Keep records of parameters as per the monitoring plan and provide hard and electronic records to the CME on a regular basis and provide the CME and DOE with required documents and access to stove users as needed;
- Make available staff for validation and verification where applicable.

The CME will enter into contractual agreements with all CPA entities as a precedent to inclusion into the programme. The agreements will summarize roles and responsibilities regarding the implementation of the individual projects as CPAs. The agreements will ensure that the CME will have control of all records and information related to the implementation of individual CPAs and will be in a position to ensure that each CPA is being implemented according to the provisions as outlined in the PoA-DD. The agreement will also put in place measures, which avoid double counting of the proposed CPA.

Confirmation that the proposed PoA is a voluntary action by the coordinating/managing entity

There are no policies, laws or mandatory requirements in the host countries (Ethiopia and Djibouti), stipulating the dissemination of cook stoves powered by renewable energy sources. The proposed PoA is a voluntary action by the CME.

Contribution to Sustainable Development

Apart from emission reduction The PoA is also expected to contribute to sustainable development in the following ways:

Environmental Benefits
1. The programme will reduce deforestation and forest degradation in areas where non-renewable biomass is used as a source of fuel. This will contribute to the overall stability of forest ecosystems, which support biodiversity and maintain cultural and aesthetic value of forestlands.

Social-economic Benefits

1. The programme will reduce indoor air pollution through reduced combustion of non-renewable biomass and fossil fuels in households/communities/SMEs. According to the WHO report on indoor air pollutions (2007)[7], toxic smoke from the combustion of firewood and fossil fuels is responsible for a range of deadly chronic and acute health effects such as child pneumonia, lung cancer, chronic obstructive pulmonary disease, and heart disease, particularly for women and children who spend a large portion of their time near the fireplaces.

2. The programme will reduce the amount of money spent to purchase fossil fuels and fuel wood.

3. The programme will also help to free time spent in search of wood fuel in places where non-renewable biomass is the fuel of choice. This will ensure that household members, particularly women have enough time to care for their children and attend to other responsibilities such as pursuing income-generating activities, education, leisure and rest. According to the Global Alliance for Cook Stoves[8] lack of access to cooking fuel forces women and children to spend many hours gathering firewood up to 5 hours per day or spend significant household income on fuel purchase.

4. The programme will reduce the risks and danger faced by women and girls when collecting firewood for cooking. Women and girls are the primary collectors of firewood. The search for firewood exposes them to attack, rape and gender violence as they venture into unsafe territories.

5. *The programme will contribute to the national hydrocarbon balance by reduction of kerosene imports for cooking purposes at the household level.*

A.3.   CME and participants of PoA

The CME of the Project Gaia Cook Stove Programme of Activities is Project Gaia Inc. There is no other project developer in the PoA apart from the CME.

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)
Ethiopia (host)	Project Gaia Inc	No
Djibouti (host)	Project Gaia Inc	No

A.5.   Physical/ Geographical boundary of the PoA

The geographical area within which Component Project Activities (CPAs) included in the PoA will be implemented is defined by the national boundaries of the host countries, Ethiopia and Djibouti.

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[7] World Health Organization, Indoor Air Pollution: National burden of Disease Estimates., Geneva: WHO (2007)

[8] http://cleancookstove.org/impact-areas/women/; Accessed on 1 April 2015.

Figure 1: Map of Ethiopia

Point	Latitude	Longitude
Point 1	14.237364°	36.609131°
Point 2	12.467558°	42.392283°
Point 3	10.957506°	42.97985°
Point 4	8.013983°	48.028539°
Point 5	3.991681°	41.936503°
Point 6	4.665675°	36.014278°
Point 7	9.510436°	34.132022°

Figure 2: Map of Djibouti

Point	Latitude	Longitude
Point 1	12.7027917°	43.1283333°
Point 2	11.9765889°	43.3686444°
Point 3	11.4952556°	42.5572889°
Point 4	11.4617833°	43.2574694°
Point 5	10.9925278°	42.9671750°
Point 6	10.9889694°	41.7881194°
Point 7	12.4643583°	42.4083139°

A.6.   Technologies/measures

The PoA will introduce measures that will reduce the emission of carbon dioxide through the displacement of fossil fuel and also the use of non-renewable biomass. The PoA will involve the distribution of energy efficient cook stoves powered by renewable biomass to end users (households/communities/SMEs), who will use the stoves for cooking. The CME will work with the CPA implementers in the distribution of the stoves to the end-users.

The stoves to be distributed will have a higher efficiency compared to the baseline technology, which is composed of inefficient wood fuel cook stoves and/or kerosene powered stoves.

Emission reductions will be achieved through the displacement of non-renewable biomass and/or fossil fuel for cooking by the end users.

A.7   Public funding of PoA

The PG PoA does not involve the use of any public funding. Each individual CPA under the PoA will provide information on public funding in section A.11 of the CDM-CPA-DD.

SECTION B.   Demonstration of additionality and development of eligibility criteria

B.1.   Demonstration of additionality for PoA

The programme involves the distribution of energy efficient cook stoves powered by renewable biomass to users thereby displacing the use of non-renewable biomass and fossil fuels for cooking. Typical CPAs to be included under the programme will be of small-scale type falling under sectoral scopes: Energy industries renewable/non-renewable sources (1).

In accordance with the *Standard for the demonstration of additionality, development of eligibility criteria and application of multiple methodologies for programmes of activities version 03.0*, additionality of the PoA is demonstrated by establishing that in the absence of the PoA, none of the implemented CPAs would have occurred.

Following the above guidance, it will be demonstrated that each small-scale CPA under the programme is additional by applying the *Guidelines on the demonstration of additionality of small-scale project activities version 09.0 (EB 68 Annex 27),* currently reclassified as the methodological tool: *Demonstration of additionality of small-scale project activities version 10.0 (EB 83 Annex 14).* Furthermore, all the CPAs petitioning for inclusion under the PoA will be required to demonstrate compliance with the additionality-related eligibility criteria set in the PoA-DD.

Therefore, it can be demonstrated that in the absence of the PoA, none of the CPAs would occur.

B.2.   Eligibility criteria for inclusion of a CPA in the PoA

In accordance with paragraph 208 of the *CDM Project Standard version 09.0*, the CME is required to consider any specific guidance in applied methodologies regarding the preparation of separate generic CPA-DDs for each different technology/measure, taking into account differences in the means of demonstration of additionality, emission reduction calculations, and monitoring methods. Based on this guidance, the programme will have two CPA types based on the host country of implementation although additional CPA types might be considered in future:

- CPA Type I: Project Gaia Cook Stove Programme of Activities - CPA000 [Insert identification number] Ethiopia
- CPA Type II: Project Gaia Cook Stove Programme of Activities - CPA000 [Insert identification number] Djibouti

The eligibility to be used for the inclusion of the CPA into the PoA has been developed in accordance to the *CDM Project Standard version 09.0* and *Standard for demonstration of additionality, development of eligibility criteria and application of multiple methodologies for Programme of Activities version 03.0 and following General Guidelines for SSC CDM methodologies version 21 while taking into consideration the applied methodologies* AMS-I.E version 06.0 and AMS-I.I version 04.0

CPA Type I: Project Gaia Cook Stove Programme of Activities - CPA000 [Insert identification number] Ethiopia

No	Requirement in PoA Standard[9]	Eligibility Criteria Description	Documentary Evidence used by CPA to demonstrate compliance (Tick where appropriate)
16 a.	**The geographical boundary of the CPA including any time-induced boundary consistent with the geographical boundary set in the PoA**	All distributed stoves in each CPA are located in the geographic boundary of Ethiopia.	☐ GPS Coordinates ☐ Area map or Address
16 b.	**Conditions that avoid double counting of emission reductions like unique identifications of product and end-user locations (e.g. programme logo)**	Double counting could occur in cases where an individual stove is included in more than one CPA under the same programme or included more than once in the same CPA. Furthermore, double counting can occur if the cook stove is included in a registered single CDM Project Activity or included in a registered PoA	For CPA [**specify title or identification number**], all the following are fulfilled: ☐ Contractual agreements between CME or CPA implementer and end-user on CER transferring. ☐ Agreement between CME and CPA implementer confirming that the CPA has not been registered as single CDM Project Activity or included in a registered CDM PoA. And, individual programme system/unit is identifiable by: ☐ Unique serial numbers that uniquely identify individual units to the programme. ☐ End user details (i.e. name, address)
16 c.	**The specifications of technology/measure including the level and type of service, performance specifications including compliance with testing/certifications;**	The CPA involves the distribution of energy efficient cook stoves powered by a renewable source.	As evidenced by the technical description/manufacturer specifications of the units: ☐ The stoves distributed under this CPA are powered by {Insert}, a renewable source. ☐ Each unit shall have a rated capacity equal to or less than 150 kW thermal ☐ The total or cumulative installed/rated thermal energy generation capacity

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[9] Standard for demonstration of additionality, development of eligibility criteria and application of multiple methodologies for Programme of Activities

			of the systems/units is equal to or less than 45 MW thermal. ☐ Confirmation by CPA implementer that each unit (insert stove type) meets the industry standards of quality.
16 d.	**Conditions to check the start date of the CPA through documentary evidence;**	CPA start date shall not be before the start date of the PoA[10] {i.e. 12 February 2015}	The start of the CPA is {DD/MM/YY}, the date when real action occurred: ☐ It is the date for which the first stove was distributed order for the first project unit was placed. ☐ It is the date for which the first project unit was distributed to the end user.
16 e.	**Conditions that ensure compliance with applicability and other requirements of single or multiple methodologies applied by CPAs**	The CPA has confirmed its compliance among other requirements, with the applicability of AMS-I.E version 6.0 and AMS-I.I version 4.0 in section D.2 of the CDM-SSC-CPA-DD-FORM. A cross effect analysis of the applicability of the methodological combination has been carried out in section D.2 of specific CPA-DD	☐ Compliance with applicability of AMS-I.E met in section D2 of specific CPA-DD ☐ Compliance with applicability of AMS-I.I met in section D2 of specific CPA-DD ☐ A cross effect analysis has been carried out in section D.2 of specific CPA-DD
16 f.	**The conditions that ensure that CPAs meet the requirements pertaining to the demonstration of additionality as specified in Section A above;**	In line with paragraph 11 of the Methodological tool: *Demonstration of additionality of small-scale project activities Version 10.0*, documentation of barrier 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). Distribution of cook stoves to households/ communities/SMEs form part of the positive list in accordance with para. 11(c)	As documented in section A.5 of the specific CPA-DD, the CPA is implemented in: ☐ Households ☐ Communities ☐ SMEs As evidenced by the technical specification of the cook stoves, and the cumulative number of units distributed under the CPA as explained on the threshold calculation in the emission reduction spread sheet, the cook stove units: ☐ Have a cumulative capacity not exceeding 45 MWth

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[10] Start date of PoA is defined as the date when notification on Prior Consideration was sent to the UNFCCC Secretariat.

		which states that: *"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"*	☐ Have a capacity of less than 5% of the small scale thresh hold.
16 g.	**The PoA-specific requirements stipulated by the CME including any conditions related to undertaking local stakeholder consultations and environmental impact analysis;**	The PoA shall undergo Local Stakeholder Consultations and Environmental Impact Assessment where required:	As evidenced by the CDM PoA-DD, CDM CPA-DD and the LSC report, a Local Stakeholder Consultation is undertaken at: ☐ PoA level ☐ CPA level As evidenced by host country regulations, the Host Country requires the EIA? ☐ Yes ☐ No If Yes, has the CPA carried out an EIA? ☐ Yes ☐ No
16 h.	**Conditions to provide an affirmation that funding from Annex I parties, if any, does not result in a diversion of official development assistance;**	If the CPA has not received any public funding from an Annex I country, it shall confirm so by providing a written confirmation letter. If a CPA has received any public funding from an Annex I country, it shall seek a confirmation letter from the Annex I country or any related agencies that the funding will not lead to a diversion of Official Development Assistance.	The CPA shall prove compliance through one of the two conditions: Through a signed confirmation letter, the CPA has proven that it has not received any public funding from an Annex I country. ☐ Yes ☐ No The CPA has received public funding from an Annex I country. Through a letter from the Annex I country, or any related agencies, the CPA has confirmed that the funding will not result in diversion of Official Development Assistance. ☐ Yes ☐ No

16 i.	**Where applicable, target group (e.g. domestic/commercial/industrial, rural/urban, grid- connected/off-grid) and distribution mechanisms (e.g. direct installation);**	In section A.7 of the CPA-DD, the CPA has already demonstrated that the CPA is implemented within the geographical boundaries of Ethiopia. The CPA will further demonstrate the target group in section A.5. of the CPA-DD.	As documented in section A.5 of the CPA-DD, the CPA is implemented in: ☐ Households ☐ Communities ☐ SMEs
16 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"** ;	Sampling will be carried out in line with the *"Standard for sampling and surveys for CDM project activities and programme of activities version 04.1* and latest guidelines for Sampling and surveys for CDM project activities and programmes of activities	As evidenced in section D.7.2 of the CPA-DD, the CPA has established sampling procedures that are in line with the CDM requirements ☐ Yes ☐ No
16 k.	**Where applicable, the conditions that ensure that every CPA in aggregate meets the small- scale or microscale threshold criteria and remains within those thresholds throughout the crediting period of the CPA;**	The cumulative number of units distributed under each CPA will not exceed 45 MWth.	As evidenced by the technical specification of each cook stove and the maximum number of cook stoves that can be distributed in the CPA as provided in emission reduction spread sheet, the cook stove units: ☐ Have a cumulative capacity not exceeding 45 MWth
16 l.	**Where applicable, the requirements for the debundling check, in case CPAs belong to small-scale (SSC) or microscale project categories.**	In accordance with the methodological tool: *Assessment of debundling for small-scale project activities version 04.0, paragraph 17*, if each of the independent subsystems/measures (e.g biogas digester, solar home system) included in the CPA of a PoA is no larger that 1% of the small scale thresholds defined in the methodology applied, then that CPA is exempted from performing a de-bundling check i.e considering as not being a de-bundled component of a large scale activity. The CPA has already demonstrated in eligibility criteria 16i that it comprises of distribution of energy efficient cook stoves powered by a	As evidenced by the technical description/manufacturer specification of the cook stoves, each independent units (cook stove): ☐ Has a rated capacity not exceeding 450 kWth

		renewable source to multiple locations (households/communities/ SMEs). The CPA will therefore have to meet the following additional eligibility criteria in order to be exempted from performing a de-bundling check.	

CPA Type II: Project Gaia Cook Stove Programme of Activities - CPA000 <mark>[Insert identification number]</mark> Djibouti

No	Requirement in PoA Standard[11]	Eligibility Criteria Description	Documentary Evidence used by CPA to demonstrate compliance (Tick where appropriate)
16 a.	**The geographical boundary of the CPA including any time-induced boundary consistent with the geographical boundary set in the PoA**	All distributed stoves in each CPA are located in the geographic boundary of Djibouti	☐ GPS Coordinates ☐ Area map or Address
16 b.	**Conditions that avoid double counting of emission reductions like unique identifications of product and end-user locations (e.g. programme logo)**	Double counting could occur in cases where an individual stove is included in more than one CPA under the same programme or included more than once in the same CPA. Furthermore, double counting can occur if the cook stove is included in a registered single CDM Project Activity or included in a registered PoA	For CPA [**specify title or identification number**], all the following are fulfilled: ☐ Contractual agreements between CME or CPA implementer and end-user on CER transferring. ☐ Agreement between CME and CPA implementer confirming that the CPA has not been registered as single CDM Project Activity or included in a registered CDM PoA. And, individual programme system/unit is identifiable by: ☐Unique serial numbers that uniquely identify individual units to the programme. ☐ End user details (i.e. name, address)
16 c.	**The specifications of**	The CPA involves the	As evidenced by the

[11] Standard for demonstration of additionality, development of eligibility criteria and application of multiple methodologies for Programme of Activities

	technology/measure including the level and type of service, performance specifications including compliance with testing/certifications;	distribution of energy efficient cook stoves powered by a renewable source.	technical description/manufacturer specifications of the units: ☐ The stoves distributed under this CPA are powered by {Insert}, a renewable source. ☐ Each unit shall have a rated capacity equal to or less than 150 kW thermal ☐ The total or cumulative installed/rated thermal energy generation capacity of the systems/units is equal to or less than 45 MW thermal. ☐ Confirmation by CPA implementer that each unit (insert stove type) meets the industry standards of quality.
16 d.	**Conditions to check the start date of the CPA through documentary evidence;**	CPA Start date shall not be before the start date of the PoA [12] {i.e. 12 February 2015}	The start of the CPA is {DD/MM/YY}, the date when real action occurred: ☐ It is the date for which the first stove was distributed order for the first project unit was placed. ☐ It is the date for which the first project unit was distributed to the end user.
16 e.	**Conditions that ensure compliance with applicability and other requirements of single or multiple methodologies applied by CPAs**	The CPA has confirmed its compliance among other requirements, with the applicability of AMS-I.E version 6.0 and AMS-I.I version 4.0 in section D.2 of the CDM-SSC-CPA-DD-FORM. A cross effect analysis of the applicability of the methodological combination has been carried out in section D2 of	☐ Compliance with applicability of AMS-I.E met in section D2 of specific CPA-DD ☐ Compliance with applicability of AMS-I.I met in section D2 of specific CPA-DD ☐ A cross effect analysis has been carried out in section D2 of specific CPA-DD

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[12] Start date of PoA is defined as the date when notification on Prior Consideration was sent to the UNFCCC Secretariat.

		specific CPA-DD	
16 f.	**The conditions that ensure that CPAs meet the requirements pertaining to the demonstration of additionality as specified in Section A above;**	In line with paragraph 11 of the Methodological tool: *Demonstration of additionality of small-scale project activities Version 10.0,* documentation of barrier 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). Distribution of cook stoves to households/ communities/SMEs form part of the positive list in accordance with para. 11(c) which states that: *"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 documented in section A.5 of the specific CPA-DD, the CPA is implemented in: ☐ Households ☐ Communities ☐ SMEs As evidenced by the technical specification of the cook stoves, and the cumulative number of units distributed under the CPA as explained on the threshold calculation in the emission reduction spread sheet, the cook stove units: ☐ Have a cumulative capacity not exceeding 45 MWth ☐ Have a capacity of less than 5% of the small scale thresh hold.
16 g.	**The PoA-specific requirements stipulated by the CME including any conditions related to undertaking local stakeholder consultations and environmental impact analysis;**	The PoA shall undergo Local Stakeholder Consultations and Environmental Impact Assessment where required:	As evidenced by the CDM PoA-DD, CDM CPA-DD and the LSC report, a Local Stakeholder Consultation is undertaken at: ☐ PoA level ☐ CPA level As evidenced by host country regulations, the Host Country requires the EIA? ☐ Yes ☐ No If Yes, has the CPA carried out an EIA? ☐ Yes ☐ No

16 h.	**Conditions to provide an affirmation that funding from Annex I parties, if any, does not result in a diversion of official development assistance;**	If the CPA has not received any public funding from an Annex I country, it shall confirm so by providing a written confirmation letter. If a CPA has received any public funding from an Annex I country, it shall seek a confirmation letter from the Annex I country or any related agencies that the funding will not lead to a diversion of Official Development Assistance.	The CPA shall prove compliance through one of the two conditions: Through a signed confirmation letter, the CPA has proven that it has not received any public funding from an Annex I country. ☐ Yes ☐ No The CPA has received public funding from an Annex I country. Through a letter from the Annex I country, or any related agencies, the CPA has confirmed that the funding will not result in diversion of Official Development Assistance. ☐ Yes ☐ No
16 i.	**Where applicable, target group (e.g. domestic/commercial/industrial, rural/urban, grid-connected/off-grid) and distribution mechanisms (e.g. direct installation);**	In section A.7 of the CPA-DD, the CPA has already demonstrated that the CPA is implemented within the geographical boundaries of Djibouti. The CPA will further demonstrate the target group in section A.5. of the CPA-DD.	As documented in section A.5 of the CPA-DD, the CPA is implemented in: ☐ Households ☐ Communities ☐ SMEs
16 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"** ;	Sampling will be carried out in line with the *"Standard for sampling and surveys for CDM project activities and programme of activities version 04.1* and latest guidelines for Sampling and surveys for CDM project activities and programmes of activities	As evidenced in section D.7.2 of the CPA-DD, the CPA has established sampling procedures that are in line with the CDM requirements ☐ Yes ☐ No
16 k.	**Where applicable, the conditions that ensure that every CPA in aggregate meets the small- scale or microscale threshold criteria and remains within those thresholds throughout the crediting period of the CPA;**	The cumulative number of units distributed under each CPA will not exceed 45 MWth.	As evidenced by the technical specification of each cook stove and the maximum number of cook stoves that can be distributed in the CPA as provided in emission reduction spread sheet, the cook stove units: ☐ Have a cumulative capacity not exceeding

			45 MWth
16 l.	**Where applicable, the requirements for the debundling check, in case CPAs belong to small-scale (SSC) or microscale project categories.**	In accordance with the methodological tool: *Assessment of debundling for small-scale project activities version 04.0, paragraph 17,* if each of the independent subsystems/measures (e.g biogas digester, solar home system) included in the CPA of a PoA is no larger that 1% of the small scale thresholds defined in the methodology applied, then that CPA is exempted from performing a de-bundling check i.e considering as not being a de-bundled component of a large scale activity. The CPA has already demonstrated in eligibility criteria 16i that it comprises of distribution of energy efficient cook stoves powered by a renewable source to multiple locations (households/communities/ SMEs). The CPA will therefore have to meet the following additional eligibility criteria in order to be exempted from performing a de-bundling check.	As evidenced by the technical description/manufacturer specification of the cook stoves, each independent units (cook stove): ☐ Has a rated capacity not exceeding 450 kWth

B.3.   Application of technologies/measures and methodologies

The PoA will introduce measures that will reduce the emissions of carbon dioxide through the displacement of fossil fuel and non-renewable biomass use. The PoA will involve the distribution energy efficient cook stoves to end users (households/institutions/SMEs), who will use the stoves for cooking. The specifications of the individual units shall be confirmed through manufactures specifications of the stoves and calculation of the total installed capacity achieved by the distributed stoves.

Activities and measures implemented under the PoA will correspond to sectoral scopes: Energy industries renewable/non-renewable sources (1). The PoA will apply a combination of approved small scale methodologies AMS-I.E '*Switch from non-renewable biomass for thermal application by the user' version 06.0* and approved baseline and monitoring methodology AMS-I.I *'Biogas/biomass thermal applications for households/small users' version 04.0*

A cross effect analysis has been carried out in section D.2. of the CDM CPA-DD as required by CDM "*Guideline for the Consideration of Interactive Effects for the Application of Multiple CDM Methodologies for a Programme of Activities (Version 01.0 - EB 68, Annex 3)."*

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

Date of Completion: 15/10/2015
Name: Elijah Isabu
Email address: info@carbonafrica.co.ke

SECTION C.   Management system

As per the *CDM Project Standard* (version 09.0), paragraph 210 the CME shall establish, implement, and provide a description of the operational and management arrangements for the implementation of the proposed CDM PoA in accordance with requirements outlined in the "*Standard for demonstration of additionality, development of eligibility criteria and application of multiple technologies for programme of activities* (version 03.0). The following management system will be implemented by the CME for the inclusion of CPAs."

Roles and responsibilities of personnel involved in the process of inclusion of CPAs, including a review of their competencies;

The CME of Project Gaia Cook stove Programme of Activities is Project Gaia Inc. Project Gaia shall provide the necessary managerial, technical, legal, communication and administrative functions to operate and manage the PoA in accordance with the CDM requirements, including the process of inclusion of CPAs. In the cases where certain functions or tasks may be outsourced, the ultimate responsibility for final quality control and approval will remain with Project Gaia as the CME.

Project Gaia will assign one director-level staff member with signing authority to have overall responsibility for the management of the PoA. The director will be supported by one or more Programme Managers and the legal and administrative managers of Project Gaia.

Competence requirements for personnel

At minimum, the following competencies will be required of the following levels of staff in order to ensure the optimal management of the PoA.

Director
- Knowledge and experience in carbon markets and CDM in particular with relation to Programmes of Activities, CDM requirements and the CDM project cycle.
- A good level of technical knowledge in the fields of renewable energy particularly on effective cook stove distribution models, community cooking patterns, community economics and financial analysis and regulatory procedures.
- Strong abilities in human resource management, critical thinking, problem solving, communication and project management.

Programme Managers and Officers

Knowledge and experience in CDM and the carbon markets and in particular the specific CDM technical and methodological aspects including:

- The technical process, project design, methodology, baseline, project boundary, calculation of GHG, environmental impact and monitoring requirements, measurement techniques, calibration and uncertainty in the measurement of the applicable parameters, impact of

failure of monitoring equipment on the measurement of emission reductions of a CPA, as relevant to technical areas within the sectoral scopes relevant to the project activity
- Assessment of additionality, including CDM related barrier analysis as appropriate
- Quantification, monitoring and reporting of GHG emissions, including relevant technical and sector issues
- Regulatory requirements relevant to CDM sectoral scopes and project activities including the technical process, project design, methodology, baseline, project boundary, calculations of GHG, environmental impact and monitoring requirements

Legal Manager and Legal Officer

- Knowledge of the CDM and the carbon markets and in particular with legal and commercial aspects
- Experience in contract and international law
- Knowledge of host country regulations

Administrative Manager and Administrative Officer

- Good understanding of the principles of data and information management
- Awareness of requirements regarding security and confidentiality
- Excellent organizational abilities

Records of arrangements for training and capacity development for personnel;

In order to ensure that CME personnel are able to improve their skills and competencies and retain relevant knowledge given the frequent changes to the CDM rules and requirements, staff will undergo a regular skills assessment. This will be conducted through an internal review of skills and competency levels or an assessment of any outsourced third parties. All CME staff will be required to complete an evaluation form and present this to their respective managers. Based on the outcomes of an evaluation meeting, appropriate internal and external training sessions will be organized as necessary for the particular personnel requirements. After receiving training, personnel will be required to circulate a report to the rest of the team as well as to the line manager. In this way, other CME staff will benefit and be kept abreast on relevant information required to ensure the CDM and PoA requirements are met.

Records of CME staff skills and competencies, completed staff evaluation forms and training reports will be stored by the respective managers in electronic form keeping in line with the file naming system.

Procedures for technical review of inclusion of CPAs;

As part of the responsibilities of the CME, a technical review of a proposed CPA will be carried out prior to the petition of inclusion to the DOE. The CME will first collect and compile all the supporting evidences stated in the eligibility criteria, and make sure it does comply accordingly with all the eligibility requirements as per the PoA-DD. The CME will also verify the authenticity of those documents by consulting with national or local authorities when necessary. Finally, the CME will verify that the CPA has not yet been developed as a single CDM project or been included in another PoA by means of checking the CDM website database, and any other documentation that may lead to such an event. An additional quality check will be done whereby another staff member from the CME, not directly involved in the development of the CPA-DD will review the CPA-DD in line with CPA-DD Internal Review Checklist as shown below.

If a CPA complies with all the technical requirements and provides the necessary documentary evidences required by the eligibility criteria as estimated by the CME, its inclusion will be approved in line with the CME responsibilities as it waits for the final assessment from the DOE.

CDM DD Internal Review Checklist

PoA TITLE	*Insert PoA title here*

Review Criteria	Compliance?		
	YES	**NO**	**Not applicable**
Have all eligibility criteria for inclusion in the PoA been met?			
Have the procedures to avoid double counting been checked?			
Have all relevant sections in the 'CPA DD been completed?			
Have emission reduction calculations been checked by the reviewer?			
If required under Section B of the CPA DD – has an environmental analysis been undertaken?			
If required under Section C of the CPA DD – has a stakeholder consultation been undertaken?			
Has all supporting documentation been cited by the reviewer?			

CPA DD is: Complete and finalized / Requires further revision *(Delete appropriate option)*

Comments:

Internal Reviewer:	
Date:	
Signature:	

Procedure to avoid double counting

Double counting could occur in cases where a cook stove is included in more than one CPA under the same programme or included more than once in the same CPA. Furthermore, double counting can occur if the individual cook stove is included in a registered single CDM Project Activity or CPA of another registered PoA.

In order to avoid double counting, the CME will take the following measures:

The CME will confirm that the CPA has not yet been included in another Programme of Activities or been registered as a single CDM project through:

- A signed confirmation letter from the CPA implementing entity that it was not yet included in another Programme of Activities or has been registered or intends to be registered as a single CDM project.
- A check by the CME on the CDM website that the project has not yet been included in another Programme of Activities or has been registered as a single CDM project. The check by the CME will be presented in a signed confirmation letter from the CME.

To ensure that the cook stove is not included in more than one CPA or project, the CME will:

- Put in place contractual agreements between CME or CPA implementer and end-user transfer of CER ownership.
- Create unique serial numbers that uniquely identify individual units to the programme.

Record keeping system for each CPA under the PoA

The CME will develop and maintain an electronic database, which will contain essential data and information about each CPA, including:

- General information about CPA:
- CPA name
- Name and contact details of the entity implementing the CPA
- Geographical location of the CPA (GPS coordinates)
- Technology employed by the CPA and installed capacity
- Commissioning date
- Start date of the CPA
- Crediting period
- Start and end date of crediting period
- Operational lifetime
- Verification status (number of verification and associated monitoring period)
- Emission reductions monitored and issued in each monitoring period
- Supporting evidence for each eligibility criterion to demonstrate that the CPA meets all the eligibility criteria for inclusion into the PoA.
- Data and information regarding the monitoring of emission reductions achieved by the CPA in line with the monitoring plan as formulated in the PoA-DD

General information regarding the CPA as well as supporting evidence for the inclusion of the CPA will be entered once into the database at the start of the implementation of the CPA. Data and information regarding monitoring of greenhouse gas emissions will be entered on a regular basis as per the requirements of the monitoring plan. All data collected as part of monitoring should be archived electronically and be kept at least for 2 years after the end of the last crediting period or the last issuance of CERs, whichever occurs later.

The CME will be responsible for entering, updating and maintaining data and information regarding CPAs into the electronic database and will have read and write access. Project Gaia, as the ultimate 'owner' of the system, has full ownership and access to all data and systems.

The CME record keeping and document processes are based on standards for quality management systems (e.g. ISO 9001) documentation requirements, which consist of:

      1. Establishing and maintaining a 'Quality Manual';
      2. Procedures for control of documents; and
      3. Procedures for control of records.

This database and other records applicable will be stored in a market leading cloud based management system that will provide the necessary infrastructure for managing document security, access and version control.

__Measures for continuous improvement of the PoA management system__

In the course of the PoA lifetime, it is likely that some of those procedures mentioned will result in insufficient control of the CME management system. In this case, the CME will keep improving its standards always taking a conservative and stricter approach with the aim of meeting the procedures described in this section. Once the crediting period is over, those new procedures in the management system will be updated.

As per standards for quality management systems (e.g. ISO 9001) the CME will therefore plan and implement monitoring and improvement processes needed to achieve the following:
- Demonstrate conformity and quality to the agreed specification
- Ensure conformity to the management system and
- Continually improve the management system

In order to achieve continual improvement, data will be collected in areas of customer satisfaction (where the customer is the CPA implementer), process performance, and product quality (where the product is the CPA-DD development process and management of the inclusion of the CPA) and the implementation of the overall management system.

The results from this collection will be analysed and action taken to improve the effectiveness and efficiency of the system.

__PoA subscription__

Each CPA will enter into a PoA Participation Agreement with the CME. The PoA Participation Agreement will include a confirmation that the entity implementing the CPA is aware and agrees that the CPA is being subscribed to the PoA.

SECTION D.   Duration of PoA

D.1.   Start date of PoA

In line with the *Glossary of CDM terms* (version 08.0), the start date of the PoA is 12 Feb 2015 which is the date when the Coordinating/Managing Entity (CME) officially notified the secretariat and the DNA of their intention to seek the CDM status. The start date of any future CPA is not, or will not be, prior to the date that the CME notified the secretariat and the DNA of their intention to seek the CDM status for the PoA.

D.2.   Duration of the PoA

28 years

SECTION E.   Environmental impacts

E.1.   Level at which environmental analysis is undertaken

To be undertaken at CPA level.

E.2.   Analysis of the environmental impacts

To be undertaken at CPA level.

SECTION F.   Local stakeholder consultation

F.1.   Solicitation of comments from local stakeholders

To be undertaken at CPA level.

F.2.   Summary of comments received

To be undertaken at CPA level.

F.3.   Report on consideration of comments received

To be undertaken at CPA level.

SECTION G.   Approval and authorization

At the time of writing this POA-DD, A letter of approval had not been issued by either of the countries in which the respective CPAs under the PoA will be implemented that is the governments of Ethiopia and Djibouti

PART II.   Generic component project activity (CPA)

GENERIC CPA TYPE I: PROJECT GAIA COOK STOVE PROGRAMME OF ACTIVITIES - CPA000 [INSERT IDENTIFICATION NUMBER] ETHIOPIA

SECTION A.   General description of a generic CPA

A.1.   Purpose and general description of generic CPAs

The purpose of the generic CPA, under the **Project Gaia Cook Stove Programme of Activities (PG PoA)** is the displacement of non-renewable biomass and fossil fuel for cooking in households/communities/SMEs through the dissemination of cook stoves powered by [insert], a renewable energy source. The CPA is of the small-scale type falling under sectoral scopes: Energy industries renewable/non-renewable sources (1).

The stoves units distributed under this CPA will not exceed a total installed/rated capacity of 45MWth while individual stoves will have a rated capacity not exceeding 150 kW thermal. This will be confirmed through the manufacture's specifications of the stoves and calculation of the total installed capacity achieved by the distributed stoves.

The eligibility criteria of the CPA has been described under section B.5 below

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

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

CPAs included under this PoA will apply a combination of approved small scale methodologies *AMS-I.E 'Switch from non-renewable biomass for thermal application by the user' version 06.0* and approved baseline and monitoring methodology *AMS-I.I 'Biogas/biomass thermal applications for households/small users' version 04.0*

Tools applicable

Methodology AMS-I.E version 06.0 makes use of the latest version of the following tool:
    a) *Tool for Project emissions from cultivation of biomass v01.0*

Methodology AMS-I.I version 04.0 does not make use of any tools.

CPAs under this PoA will not utilize a standardized baseline.

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

The CPA meets the applicability of approved methodologies AMS-I.E 'Switch from non-renewable biomass for thermal application by the user' version 06.0 and AMS-I.I 'Biogas/biomass thermal applications for households/small users' version 04.0 as justified in the Table 2 and Table 3 below.

The combination of these methodologies is applicable based on the *Standard demonstration of additionality, development of eligibility criteria and application of multiple methodologies for programmes of activities version 03.0 paragraph 30* which states that 'Combinations of technologies/measures and/or methodologies for a PoA are eligible where it is demonstrated that there are no cross effects between the technologies/measures applied.

A cross effect analysis has been carried out in line with the CDM *Guideline for the Consideration of Interactive Effects for the Application of Multiple CDM Methodologies for a Programme of Activities (Version 01.0 - EB 68, Annex 3).* The analysis has proven that there are no cross-effects whatsoever in the combination of the two methodologies as outlined in paragraph 13 of the *Guideline for the Consideration of Interactive Effects for the Application of Multiple CDM Methodologies for a Programme of Activities (Version 01.0 - EB 68, Annex 3).* The analysis is shown in Table 1 below:

Table 1: Cross Effect Analysis

Type of interactive effect	Justification of non-interactive effect by the CPA
a) Type I: interactive effects could occur when there is **an exchange of energy** (thermal, mechanical or electrical) or mass transfer between different measures of the CPA, the transfer occurring from a primary, independent measure to a dependent measure;	a) There is no exchange of energy between (insert stoves type) that displaces kerosene stove and (insert stoves type) cook stove that displaces a wood/charcoal stove.
b) Type II: interactive effects could also occur when several measures rely on the **same information** when estimating emission reductions. For example, several measures refer to historical fuel/electricity/heat consumption. They may also occur when combining methodologies relying solely on default factors for setting the baseline.	b) Emission reduction calculations are a function of consumption of baseline fuel and stove efficiency. The CPA relies on different information for the estimation of baseline fuel consumption and baseline stove efficiency. Information about project stove efficiency is the same but this is not relevant in terms of cross effects.

Applicability criteria for AMS-I.I *'Biogas/biomass thermal applications for households/small users'* version 04.0.

Table 2: Applicability of AMS-I.I version 04.0

Methodology Applicability	Justification
This category comprises activities for generation of renewable thermal energy using renewable biomass or biogas for use in residential, commercial, institutional applications (e.g. for supply to households, small farms or for use in built environment of institutions such as schools). Examples of these technologies that displace or avoid fossil fuel use include but are not limited to biogas cook stoves, biomass briquette cook stoves, small scale baking and drying systems, water heating, or space heating systems.	CPA included under this PoA will distribute stoves that generate renewable thermal energy using [insert fuel] which is a renewable biomass.
The total installed/rated thermal energy generation capacity of the project equipment is equal to or less than 45 MW thermal.	The estimated, cumulative rated thermal energy generation capacity installed under the CPA will not exceed 45 MWth.
Each unit (e.g. cook stove, heater) shall have a rated capacity equal to or less than 150 kW thermal. Projects that include units with rated capacity greater than 150 kW thermal may explore AMS-I.C Thermal energy production with or without electricity	The stoves distributed under the CPA have a maximum rated capacity of [insert] kWth, which is less than 150kW
For the specific case of biomass residues processed as a fuel (e.g. briquettes, wood chips), it shall be demonstrated that: a) It is produced using solely renewable biomass (more than one type of biomass may be used). Energy use for renewable biomass processing (e.g. shredding and compacting in the case of briquetting) may be considered as equivalent to the upstream emissions associated with the processing of the displaced fossil fuel and hence disregarded; b) The General guidance on leakage in biomass project activities (attachment C to appendix B of 4/CMP.1 Annex II) shall be followed; c) The project participant can monitor the mass, moisture content and NCV of the resulting biomass fuel, through sampling that meets the confidence/precision level of 90/10; d) Where the project participant is not the producer of the renewable fuel, the project participant and the producer are bound by a contract that shall enable the project participant to monitor the source of	Where biomass residues processed as a fuel is used: a) Stoves included under this PoA on the individual CPAs will use only (insert fuel type) from renewable sources, the (insert fuel type) used is considered renewable based on the definition of renewable biomass -in EB 23 Annex 18. b) The CPA will meet the set criteria in accordance with the general guidance on leakage in biomass project activities. c) The project participant will monitor the NCV of the (insert fuel type) used by the stoves through sampling that meets 90/10 confidence precision level. d) The project participant will get into a contract with the producer of ethanol allowing him to monitor the source of ethanol and account for any leakages. Where other forms of renewable biomass or sources of renewable energy are used, this applicability criteria shall not apply

renewable biomass to account for any emissions associated with biomass production (as per 4(b) above). Such a contract shall also ensure that there is no double counting of emission reductions.	
The methodology is applicable to a programme of activities, no additional leakage estimations are necessary other than that indicated under leakage section above.	The CPA is part of the Project Gaia Cook Stove Programme of Activities. The generic CPA will comply with the necessary leakage estimations indicated above.

Applicability criteria for AMS-I.E '*Switch from non-renewable biomass for thermal application by the user*' version 06.0

Table 3: Applicability of AMS-I.E version 06.0

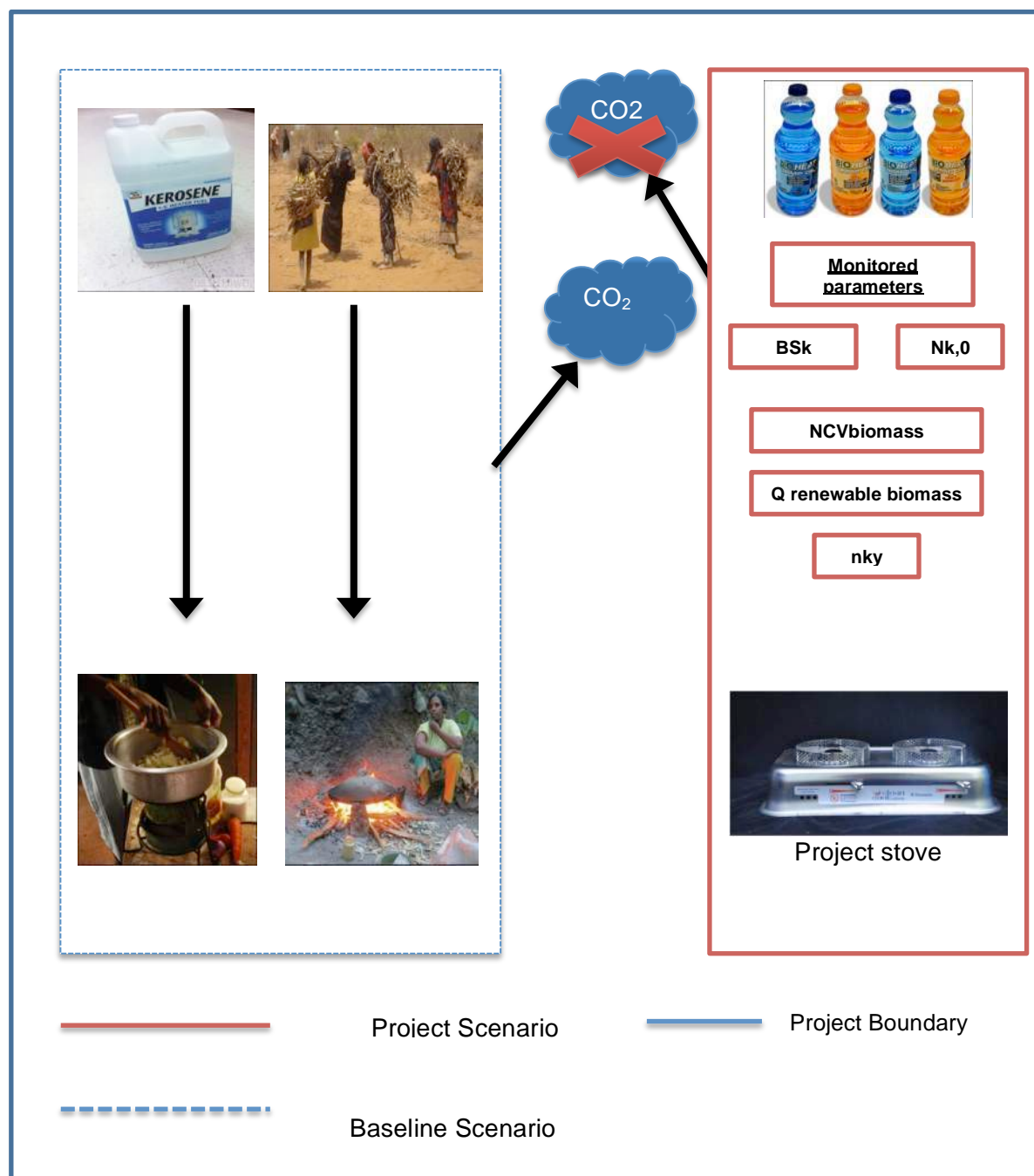| Applicability	Justification
This methodology comprises of activities to displace the use of non-renewable biomass by introducing renewable energy technologies. Examples of these technologies include, but are not limited to biogas stoves, solar cookers, passive solar homes, renewable energy based drinking water treatment technologies (e.g. sand filters followed by solar water disinfection; water boiling using renewable biomass).	CPA included under this PoA will distribute stoves that will displace the use of non-renewable wood fuel (firewood and charcoal) with stoves that use [insert] as fuel, which is a renewable biomass.
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.	The project participant will evidence in each CPA that non-renewable biomass has been in use since 31 December 1989 using either published literature, official report or statistics.
The methodology is applicable for technologies displacing use of non-renewable biomass by renewable energy	The technologies implemented under this CPA will be energy efficient cook stoves that use [insert] which is a renewable biomass that will displace the use of wood fuel which is a non-renewable biomass used by the baseline stoves.
The use of this methodology in a project activity under a programme of activities (PoA) is legitimate if the following leakages are estimated and accounted for, if required, on a sample basis using a 90/30 precision for the selection of samples, and accounted for: (a) Use of non-renewable woody biomass saved under the project activity to justify the baseline of other CDM project activities can also be a potential source of leakage. If this leakage assessment quantifies a portion of non-renewable woody biomass saved under the project activity that is then used as the baseline of other CDM project activities then By is adjusted to account for the quantified leakage; (b) Increase in the use of non-renewable woody	a) The CPA accounts for leakage that arises from non-renewable woody biomass saved under the CPA.

biomass outside the project boundary to create non-renewable woody biomass baselines can also be a potential source of leakage. If this leakage assessment quantifies an increase in the use of non-renewable woody biomass outside the project boundary, then By is adjusted to account for the quantified leakage;	b) Leakage arising from the increased use of non-renewable woody biomass is accounted for in the CPA.
(c) As an alternative to subparagraphs (a) and (b), *By* can be multiplied by a net to gross adjustment factor of 0.95 to account for leakages, in which case surveys are not required.	c) Applicable since the CPA applies the net to gross adjustment factor to account for leakages.
The following further conditions apply for the value of fraction of non-renewable (fNRB) applied in a component project activity (CPA) of a PoA. The choice between (a) conduct own studies to determine the local fNRB value and then apply those values in the CPAs; and (b) use default national values approved by the Board; shall be made ex ante. A switch from national value i.e. choice (b) to sub-national values i.e. choice (a) is permitted, under the condition that the selected approach is consistently applied to all CPAs.	The CPA applies (b) the use default national values approved by the Board.

B.3.   Sources and GHGs

In accordance with the approved small-scale methodology AMS-I.I *'Biogas/biomass thermal applications for households/small users' version 04.0,* the project boundary is the physical, geographical sites of the equipment producing thermal energy during the crediting period. Likewise, according to AMS-I.E '*Switch from non-renewable biomass for thermal application by the user' version 06.0,* the project boundary is the physical, geographical site of the use of biomass or the renewable energy.

Cook stoves units distributed under this CPA will be located within the national boundaries of the Ethiopia. The flow diagram below highlights the equipment, systems, emission sources and gases included in the boundary as well as the monitoring parameters in the CPA boundary.

The greenhouse gases and emission sources included in or excluded from the project boundary are shown in the table below.

	Source	Gas	Included	Justification
Baseline Emissions	**Combustion of non-renewable biomass for cooking**	CO_2	Yes	Main source of emission under AMS-I.E
		CH_4	No	Not considered as a source of emissions as per AMS-I.E
		N_2O	No	Not considered as a source of emissions as per AMS-I.E
	Combustion of fossil fuel for cooking	CO_2	Yes	Main source of emission under AMS-I.I
		CH_4	No	Minor source of emissions as per AMS-I.I
		N_2O	No	Not considered as a source of emissions as per AMS-I.I
Project Emissions	**Combustion of non-renewable biomass for cooking**	CO_2	No	Not relevant for the project as it does not involve cultivation of biomass
		CH_4	No	Not relevant under methodology AMS-I.E
		N_2O	No	Not relevant under methodology AMS-I.E
	Combustion of fossil fuel for cooking	CO_2	No	Not relevant under the option chosen in AMS-I.I
		CH_4	No	Not relevant under methodology AMS-I.I
		N_2O	No	Not relevant under methodology AMS-I.I

B.4. Description of baseline scenario

In accordance with AMS-I.E version 6.0, it is assumed that in the absence of the project activity, the baseline scenario would be the use of non-renewable biomass for meeting similar thermal energy needs. Similarly, AMS-I.I version 4.0 states that the baseline is the fuel consumption of the thermal application used or that would have been used in the absence of the project activity times an emission factor for the fossil fuel displaced.

Therefore, in the baseline scenario of the CPA, CO_2 would have been produced from the combustion of non-renewable biomass and fossil fuels for cooking purposes.

According to world energy outlook, in developing countries and especially in rural areas, 2.5 billion people rely on biomass, such as firewood, charcoal, agriculture waste and animal dung, for their cooking needs. In these countries, this resources account for over 90% of the household energy consumption. In absence of better policies this demand is projected to increase from 2.6 billion

reliance in 2015 to 2.7 billion reliance in 2030. This will represent one third of the world population relying on biomass as their source of cooking energy.[13]

The use of biomass itself hasn't been indicated as being the main concern but rather its harvesting which has been cited as being done in an unsustainable manner. The use of inefficient technologies for energy conversion purpose has had adverse effects on the population in which it's employed, these effects range from social effects such as health effects, environmental effects to economical development effects.[14]

About 4.3 million people die yearly prematurely from illnesses attributed to household air pollution caused by the inefficient use of solid fuels[15]. Valuable time and effort is devoted to fuel collection instead of education or income generation.[16]

Two complementary approaches have singled out as a remedy to the situation; promoting more efficient and sustainable use of traditional biomass and encouraging people to switch to modern cooking fuels and technologies.[17]

The quantity of house energy demand in developing countries in 2004 was about 1090 Mtoe with household biomass in developing countries accounting for almost 70% of the world primary energy demand, the use being primarily on household cooking followed by heating space and water heating. [18]

In Sub-Saharan Africa about 76% of the population depends on biomass for cooking.[19] Closer look at regions in Africa below show the high consumption of biomass by Africa countries[20]

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[13] World Energy Outlook 2006

[14] https://www.iea.org/publications/freepublications/publication/cooking.pdf. Accessed on 25 Sep 2015

[15] http://www.who.int/mediacentre/factsheets/fs292/en/ . Accessed on 25 Sep 2015

[16] https://www.iea.org/publications/freepublications/publication/cooking.pdf. Accessed on 25 Sep 2015

[17] World Energy Outlook 2006

[18] https://www.iea.org/publications/freepublications/publication/cooking.pdf

[19] World Energy Outlook 2006

[20] Wood-Based Biomass Energy Development for Sub-Saharan Africa

Percentage of total energy consumption

Biomass (including woodfuel energy consumption (2005)
in thousands of metric tonnes oil equivalent (ktoe)
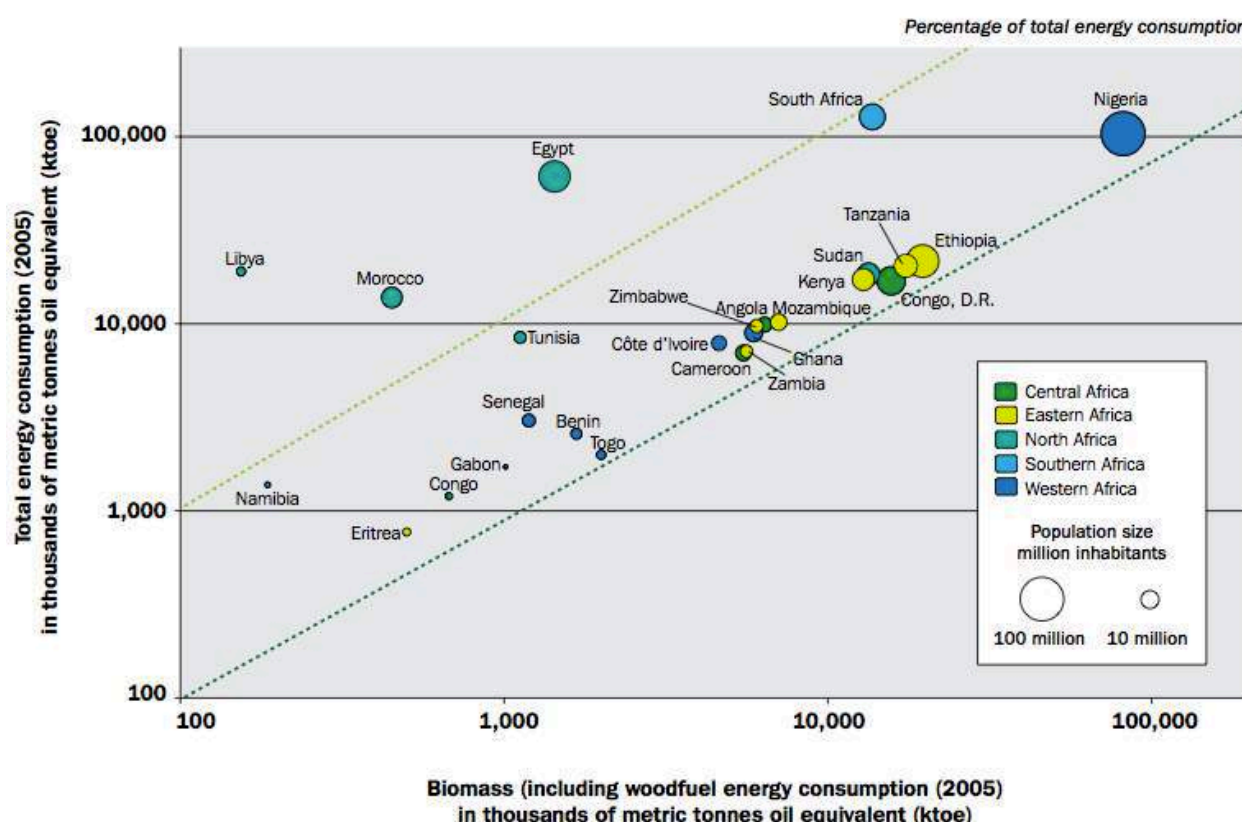
Ethiopia's energy sector is highly dependent on biomass energy sources, such as fuel wood and charcoal, which account for more than 90% of total domestic energy demand[21]. This pattern is a major cause of land degradation, biodiversity loss and deforestation in the country. In Ethiopia, biomass stock from forests (above-ground biomass) decreased from 484 million tonnes in 1990 to only 367 million tonnes in 2010[22]. It is also indicated that wood fuel removals have increased from 100,376,000m^3 in 2000 to 108,548,000m^3 in 2005. These figures along with the decrease in forest biomass clearly indicate that non-renewable biomass is being used by households and institutions for the generation of thermal energy.

Ethiopia had a total population of 94.1 million and population growth rate of 2.6% in 2013[23] the second highest in Sub-Saharan Africa, with 84% of the population living in the rural areas.[24] The average household size is 5 people.[25] According to the Ethiopian Central Statistical Authority, at the national level, about 85% of the households use fuel wood for cooking purposes and only 1.2% of the households use kerosene for cooking[26]. A household survey conducted in Ethiopia indicates a monthly consumption of 27 litres of kerosene per household[27] using kerosene wick stove. In the last decade, kerosene use in Ethiopia has declined considerably as a result of a doubling in the cost of kerosene, largely because of the removal of subsidies by the government. A large proportion of kerosene users have shifted to fuel wood.

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[21] Ethiopian Environmental Protection Agency (EPA). (2004), The third national report on the implementation of the UNCCD/NAP in Ethiopia

[22] FAO Global Forest Resource Assessment (2010) Country Report- Ethiopia: http://www.fao.org/docrep/013/al501E/al501e.pdf

[23] World Bank. (2013) Ethiopia Overview. Accessed on 12 May 2015: http://www.worldbank.org/en/country/ethiopia/

[24] FAO-AQUASTAT (2015). Country Fact Sheet - Ethiopia

[25] Ethiopia Demographic and Health Survey (2005) Household Population and Housing Characteristics : http://dhsprogram.com/pubs/pdf/FR179/FR179[23June2011].pdf

[26] Central Statistical Agency (2011). Ethiopian Monitoring Survey-Summary report

[27] Business Plan for Ethanol Cooking Fuel and Dometic CleanCook Stove Market Development in Ethiopia Household Energy Survey (2007)

The total fuel wood consumption by the rural households is estimated to be 89,115,753 tonnes/year urban households are estimated to consume 11,167,156 tonnes/year[28].

B.5. Demonstration of eligibility for a generic CPA

In accordance with para 208 of the CDM Project Standard version 09.0, the CME is required to consider any specific guidance in applied methodologies regarding the preparation of separate generic CPA-DDs for each different technology/measure, taking into account differences in the means of demonstration of additionality, emission reduction calculations, and monitoring methods. Based on this guidance, the programme will have two CPA types based on the host country of implementation although additional CPA types might be added in future:

- CPA Type I: Project Gaia Cook Stove Programme Of Activities - CPA000 [Insert identification number] Ethiopia
- CPA Type II: Project Gaia Cook Stove Programme Of Activities - CPA000 [Insert identification number] Djibouti

This CPA will fall under CPA Type I. The eligibility to be used for the inclusion of the CPA into the PoA has been developed in accordance to the CDM project standard (version 09.0) and *Standard for demonstration of additionality, development of eligibility criteria and application of multiple methodologies for Programme of Activities version 03.0 and following General Guidelines for SSC CDM methodologies version 21 while taking into consideration the applied methodologies* AMS-I.E version 06.0 and AMS-I.I version 04.0

CPA Type I: Project Gaia Cook Stove Programme Of Activities - CPA000 [Insert identification number] Ethiopia

No	Requirement in PoA Standard29	Eligibility Criteria Description	Documentary Evidence used by CPA to demonstrate compliance (Tick where appropriate)
16 a.	**The geographical boundary of the CPA including any time-induced boundary consistent with the geographical boundary set in the PoA**	All distributed stoves in each CPA are located in the geographic boundary of Ethiopia.	☐ GPS Coordinates ☐ Area map or Address
16 b	**Conditions that avoid double counting of emission reductions like unique identifications of product and end-user locations (e.g. programme logo)**	Double counting could occur in cases where an individual stove is included in more than one CPA under the same programme or included more than once in the same CPA. Furthermore, double counting can occur if the cook stove is included in a registered single CDM Project Activity or included in a registered PoA	For CPA [**specify title or identification number**], all the following are fulfilled: ☐ Contractual agreements between CME or CPA implementer and end-user on CER transferring. ☐ Agreement between CME and CPA implementer confirming

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[28] European Union Energy Initiative (2013) Biomass Energy Strategy Ethiopia

[29] Standard for demonstration of additionality, development of eligibility criteria and application of multiple methodologies for Programme of Activities

		that the CPA has not been registered as single CDM Project Activity or included in a registered CDM PoA .
		And, individual programme system/unit is identifiable by:
		☐Unique serial numbers that uniquely identify individual units to the programme. ☐ End user details (i.e. name, address)
16 c.	**The specifications of technology/measure including the level and type of service, performance specifications including compliance with testing/certifications;**	The CPA involves the distribution of energy efficient cook stoves powered by a renewable source.	As evidenced by the technical description/manufacturer specifications of the units: ☐ The stoves distributed under this CPA are powered by {Insert}, a renewable source. ☐ Each unit shall have a rated capacity equal to or less than 150 kW thermal ☐ The total or cumulative installed/rated thermal energy generation capacity of the systems/units is equal to or less than 45 MW thermal. ☐Confirmation by CPA implementer that each unit (insert stove type) meets the industry standards of quality.
16 d.	**Conditions to check the start date of the CPA through documentary evidence;**	CPA Start date shall not be before the start date of the PoA [30] {i.e. 12 February 2015}	The start of the CPA is {DD/MM/YY}, the date when real action occurred: ☐ It is the date for which the first stove was distributed order for the first project unit was placed. ☐ It is the date for which the first project unit was

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[30] Stat date of PoA is defined as the date when notification on Prior Consideration was sent to the UNFCCC Secretariat.

			distributed to the end user.
16 e.	**Conditions that ensure compliance with applicability and other requirements of single or multiple methodologies applied by CPAs**	The CPA has confirmed its compliance among other requirements, with the applicability of AMS-I.E version 6.0 and AMS-I.I version 4.0 in section D.2 of the CDM-SSC-CPA-DD-FORM. A cross effect analysis of the applicability of the methodological combination has been carried out in section D2 of specific CPA-DD	☐ Compliance with applicability of AMS-I.E met in section D2 of specific CPA-DD ☐ Compliance with applicability of AMS-I.I met in section D2 of specific CPA-DD ☐ A cross effect analysis has been carried out in section D2 of specific CPA-DD
16 f.	**The conditions that ensure that CPAs meet the requirements pertaining to the demonstration of additionality as specified in Section A above;**	In line with paragraph 11 of the Methodological tool: *Demonstration of additionality of small-scale project activities Version 10.0,* documentation of barrier 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). Distribution of cook stoves to households/ communities/SMEs form part of the positive list in accordance with para. 11(c) which states that: *"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 documented in section A.5 of the specific CPA-DD, the CPA is implemented in: ☐ Households ☐ Communities ☐ SMEs As evidenced by the technical specification of the cook stoves, and the cumulative number of units distributed under the CPA as explained on the threshold calculation in the emission reduction spread sheet, the cook stove units: ☐ Have a cumulative capacity not exceeding 45 MWth ☐ Have a capacity of less than 5% of the small scale thresh hold.
16 g.	**The PoA-specific requirements stipulated by the CME including any**	The PoA shall undergo Local Stakeholder Consultations and	As evidenced by the CDM PoA-DD, CDM CPA-DD and the LSC

	conditions related to undertaking local stakeholder consultations and environmental impact analysis;	Environmental Impact Assessment where required:	report, a Local Stakeholder Consultation is undertaken at: ☐ PoA level ☐ CPA level As evidenced by host country regulations, the Host Country requires the EIA? ☐ Yes ☐ No If Yes, has the CPA carried out an EIA? ☐ Yes ☐ No
16 h.	**Conditions to provide an affirmation that funding from Annex I parties, if any, does not result in a diversion of official development assistance;**	If the CPA has not received any public funding from an Annex I country, it shall confirm so by providing a written confirmation letter. If a CPA has received any public funding from an Annex I country, it shall seek a confirmation letter from the Annex I country or any related agencies that the funding will not lead to a diversion of Official Development Assistance.	The CPA shall prove compliance through one of the two conditions: Through a signed confirmation letter, the CPA has proven that it has not received any public funding from an Annex I country. ☐ Yes ☐ No The CPA has received public funding from an Annex I country. Through a letter from the Annex I country, or any related agencies, the CPA has confirmed that the funding will not result in diversion of Official Development Assistance. ☐ Yes ☐ No
16 i.	**Where applicable, target group (e.g. domestic/commercial/industrial, rural/urban, grid-connected/off-grid) and distribution mechanisms (e.g. direct installation);**	In section A.7 of the CPA-DD, the CPA has already demonstrated that the CPA is implemented within the geographical boundaries of Ethiopia. The CPA will further demonstrate the target group in section A.5. of the CPA-DD.	As documented in section A.5 of the CPA-DD, the CPA is implemented in: ☐ Households ☐ Communities ☐ SMEs
16 j	**Where applicable, the conditions related to sampling requirements for the PoA in accordance with the "Standard for sampling**	Sampling will be carried out in line with the *"Standard for sampling and surveys for CDM project activities and programme of activities*	As evidenced in section D.7.2 of the CPA-DD, the CPA has established sampling procedures that are in line with the CDM

	and surveys for CDM project activities and programme of activities" ;	*version 04.1* and latest *guidelines for sampling and surveys for CDM project activities and programmes of activities*	requirements ☐ Yes ☐ No
16 k.	Where applicable, the conditions that ensure that every CPA in aggregate meets the small- scale or microscale threshold criteria and remains within those thresholds throughout the crediting period of the CPA;	The cumulative number of units distributed under each CPA will not exceed 45 MWth.	As evidenced by the technical specification of each cook stove and the maximum number of cook stoves that can be distributed in the CPA as provided in emission reduction spread sheet, the cook stove units: ☐ Have a cumulative capacity not exceeding 45 MWth
16 l.	Where applicable, the requirements for the debundling check, in case CPAs belong to small-scale (SSC) or microscale project categories.	In accordance with the methodological tool: *Assessment of debundling for small-scale project activities version 04.0*, project activities that consist of independent subsystems that are distributed in multiple locations and are not greater than 1% of the small-scale thresholds defined by SSC methodologies, these project activities are exempted from performing a de-bundling check i.e. considered as being not a de-bundled component of a large scale activity. The CPA has already demonstrated in eligibility criteria 16i that it comprises of distribution of energy efficient cook stoves powered by a renewable source to multiple locations (households/communities/ SMEs). The CPA will therefore have to meet the following additional eligibility criteria in order to be exempted from performing a de-bundling check.	As evidenced by the technical description/manufacturer specification of the cook stoves, each independent units (cook stove): ☐ Has a rated capacity not exceeding 450 kWth

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

B.6.1. Explanation of methodological choices

The CPA will utilize a combination of two methodologies to estimate the emission reductions achieved by (insert stove type) stoves distributed under the CPA.

    a) AMS-I.E '*Switch from non-renewable biomass for thermal application by the user' version 06.0* and approved baseline and monitoring methodology

    b) AMS-I.I *'Biogas/biomass thermal applications for households/small users' version 04.0*

The combination of these methodologies is applicable based on the *Standard demonstration of additionality, development of eligibility criteria and application of multiple methodologies for programmes of activities* version 03.0 paragraph 30 which states that 'Combinations of technologies/measures and/or methodologies for a PoA are eligible where it is demonstrated that there are no cross effects between the technologies/measures applied.

A cross effect analysis has been carried out and it has been proven that there are no cross-effects as indicated in section D.2 of the CPA-DD.

Further to the cross effect analysis the combination of the two methodologies is permissible based on paragraph 31.C of the *Standard demonstration of additionality, development of eligibility criteria and application of multiple methodologies for programmes of activities* version 03.0, based on the following argument:

- A principle technology/measure is applied consistently in each CPA using multiple combinations of methodologies. For example, wastewater treatment projects with different ways of utilizing recovered methane (AMS-I.C for heat, AMS-I.D and AMS-I.F for electricity, or both), biomass/biogas projects with different fuel displacement (AMS-I.C and AMS -I.I for fossil fuel, AMS-I.E for non - renewable biomass, or both). The CPAs included under this PoA will apply only one technology/measure that is distribution of efficient cook stoves that utilize renewable biomass to replace either the non-renewable biomass powered cook stoves (firewood and charcoal) or fossil fuel powered cook stoves.

Calculation of emission reductions from the displacement of non-renewable biomass and displacement of fossil fuel

The CPA will utilize the two methodologies to calculate the amount of emission reductions achieved by the project. The methodological application will take into account the baseline fuel being displaced by the project appliance as either non-renewable biomass or fossil fuel.

Calculation of emission reduction from the displacement of non-renewable biomass applying methodology AMS-I.E version 06.0

The methodology assumes that in the absence of the project activity the baseline would be the use of non-renewable biomass for meeting similar thermal needs.

The following steps will be used to calculate emission reduction as per the methodology:

Baseline emissions

Equation 1 of the methodology will be used to estimate the emission reductions

$$ER_y = B_y \times f_{NRB,y} \times NCV_{biomass,i}, \times EF_{projected\_fossil\_fuel} - PE_{BC,y} \qquad \text{Equation (1)}$$

Where:

ER_y	=	Emission reductions during the year y in tCO2e
B_y	=	Quantity of woody biomass that is substituted or displaced in tonnes
$f_{NRB,y}$	=	Fraction of woody biomass used in the absence of the project activity in year y that can be established as non-renewable biomass using survey methods or government data or approved default country specific fraction of non-renewable woody biomass (fNRB) values available on the CDM website
$NCV_{biomass,i}$	=	Net calorific value of the non-renewable woody biomass that is substituted (IPCC default for wood fuel, 0.015 TJ/tonne)
$EF_{projected\_fossil\ fuel}$	=	Emission factor for the substitution of non-renewable woody biomass by similar consumers. Use a value of 81.6 t CO2/TJ
$PE_{BC,y}$	=	Project emissions due to cultivation of biomass

Determination of B_y

In accordance with paragraph 12 of AMS-I.E version 06.0, the CPA will determine B_y using option (a) which is explained below:

(a)   Calculated as the product of the number of appliances multiplied by the estimate of average annual consumption of woody biomass per appliance (tonnes/year); This can be derived from historical data or estimated using survey methods;

B_y will be determined using the following equation:

$$By = Q_{biomass} * N_{k,0} * n_{k,y} * P_{non-renewable}$$

Where:

Parameter	Description
B_y	Quantity of woody biomass that is substituted or displaced per appliance/household in tonnes per year
$Q_{biomass}$	Average annual consumption of woody biomass per appliance/household.
$N_{k,0}$	Number of cook stoves distributed by the CPA in year 1
$P_{non-renewable}$	Proportion of distributed cook stoves that are displacing non-renewable biomass
$n_{k,y}$	Proportion of distributed cook stoves that remain operational in year 1 of operation

Determination of $f_{NRB,y}$

In accordance with AMS-I.E, the CPA is capable of using the following options for the estimation of f_{NRB}

a) Using surveys, government data or values from the CDM website
b) Determined following the following guidelines:

Differentiation between non-renewable and renewable woody biomass

Project participants need to determine the shares of renewable biomass and non-renewable biomass in B_y (the quantity of woody biomass used in the absence of the project activity) using nationally approved methods (e.g. surveys or government data if available) and then determine $f_{NRB,y}$ as described below.

Demonstrably renewable woody biomass (DRB)

Woody biomass is "renewable" if one of the following two conditions is satisfied:

(a) The woody biomass is originating from land areas that are forests where:

    (i) The land area remains a forest;

    (ii) Sustainable management practices are undertaken on these land areas to ensure, in particular, that the level of carbon stocks[31] on these land areas does not systematically decrease over time (carbon stocks may temporarily decrease due to harvesting); and

    (iii) Any national or regional forestry and nature conservation regulations are complied with;

(b) The biomass is woody biomass and originates from non-forest areas (e.g. croplands, grasslands) where:

    (i) The land area remains cropland and/or grasslands or is reverted to forest;

    (ii) Sustainable management practices are undertaken on these land areas to ensure in particular that the level of carbon stocks on these land areas does not systematically decrease over time (carbon stocks may temporarily decrease due to harvesting); and

    (iii) Any national or regional forestry, agriculture and nature conservation regulations are complied with.

Non-renewable biomass

NRB is the quantity of woody biomass used in the absence of the project activity (B_y) minus the *DRB* component, as long as at least two of the following supporting indicators are shown to exist:

(a) A trend showing an increase in time spent or distance travelled for gathering fuel-wood, by users (or fuel-wood suppliers) or alternatively, a trend showing an increase in the distance the fuel-wood is transported to the project area;

(b) Survey results, national or local statistics, studies, maps or other sources of information, such as remote-sensing data, that show that carbon stocks are depleting in the project area;

(c) Increasing trends in fuel wood prices indicating a scarcity of fuel-wood;

(d) Trends in the types of cooking fuel calculated by users that indicate a scarcity of woody biomass.

Thus, the fraction of woody biomass saved by the project activity in year *y* that can be established as non-renewable, is:

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

Project participants shall also provide evidence that the trends identified are not occurring due to the enforcement of local/national regulations.

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[31] Carbon stocks may be estimated following the procedures described in the methodological tool "Project emissions from cultivation of biomass".

The CPA will apply option (a) to determine the fraction of non-renewable biomass $f_{NRB,y}$

Project emissions (PE_BC,y)

No project emission will be accounted for since the project does not involve cultivation of biomass.

Leakage

Leakage related to the non-renewable woody biomass saved by the project activity shall be assessed based on ex post surveys of users and the areas from which this woody biomass is sourced (using 90/30 precision for a selection of samples). The following potential source of leakage shall be considered:

a) The use/diversion of non-renewable woody biomass saved under the project activity by non-project households/users that previously used renewable energy sources. If this leakage assessment quantifies an increase in the use of non- renewable woody biomass used by the non-project households/users that is attributable to the project activity then B_y is adjusted to account for the quantified leakage. Alternatively, B_y is multiplied by a net to gross adjustment factor of 0.95 to account for leakages, in which case surveys are not required.

The CPA will apply the gross adjustment factor as mentioned above, to account for leakage. Therefore, ex post surveys will not be required.

In accordance with paragraph 20 of the methodology, the general guidance on leakage in biomass project activities shall be followed to quantify leakages pertaining to the use of biomass residues. This document has since been reclassified as the methodological tool: *Leakage in biomass small-scale project activities version 04 (EB 83 Annex 15).* In line with paragraph 23 of the methodological tool, the CPA will evaluate ex ante if there is a surplus of the biomass in the region of the project activity, which is not utilised. If it is demonstrated (e.g., using published literature, official reports, surveys etc.) at the beginning of each crediting period that the quantity of available biomass in the region (e.g., 50 km radius), is at least 25% larger than the quantity of biomass that is utilised including the project activity, then this source of leakage can be neglected otherwise this leakage shall be estimated and deducted from the emission reductions

Thus:

Net Emission Reductions = Emission Reductions per cook stove* Number of appliances– Leakage from biomass residues-PE_BC,y

Calculation of emission reduction from the displacement of non-renewable biomass applying methodology AMS-I.I version 04.0

Baseline emissions
The methodology describes the baseline, as in the absence of the project the alternative would be the use of fossil fuel for provision of thermal needs to the end-user.

Emissions reductions are calculated following the steps below:

Emission reductions are determined using option (2) of the methodology, based on the thermal energy generated and applying equation 4 as follows

$$ER_y = \sum_k N_{k,0} * n_{k,y} * BS_{k,y} * EF * \eta_{PJ/BL} * NCV_{biomass} - LE_y$$

Where:

ER$_y$ Emission reductions during the year y in t CO2e
N$_{k,0}$ Number of thermal applications *k* commissioned
η$_{k,y}$ Proportion of N$_{k,0}$ that remain operating at year *y* (fraction)
BS$_{k,y}$ The net quantity of renewable biomass or biogas consumed by the thermal application k in year y (mass or volume units, dry basis)
EF   CO2 emission factor (tCO2/GJ)

$$EF = \sum_j x_j * EF_{FF,j}$$

x$_j$ is a fraction representing fuel type j used by the baseline thermal applications displaced by biomass/biogas

η$_{PJ/BL}$ Ratio of efficiencies of project equipment and baseline equipment (e.g. cook stove using coal) measured once prior to validation applying the same test procedure (e.g. lab test), as per a national or an international standard. Official data or scientific literature can be used for cross-check purposes
NCV$_{biomass}$ Net calorific value of the biomass (GJ/unit mass or volume, dry basis).

Project emissions

No project emissions are accounted under the selected option for calculating emission reductions.

Leakage emissions

The project equipment will not be transferred out of the project boundary and so no leakage emissions are to be accounted based on paragraph 15 of the methodology, which states that 'If the energy generating equipment introduced by the project activity is transferred from outside the boundary to the project activity, leakage is to be considered.'

In accordance with paragraph 4(b) of the methodology, where biomass residues processed as a fuel is used, the general guidance on leakage in biomass project activities shall be followed to quantify leakages pertaining to the use of biomass residues. This document has since been reclassified as the methodological tool: *Leakage in biomass small-scale project activities version 04 (EB 83 Annex 15).* In line with paragraph 23 of the methodological tool, the CPA will evaluate ex ante if there is a surplus of the biomass in the region of the project activity, which is not utilised. If it is demonstrated (e.g., using published literature, official reports, surveys etc.) at the beginning of each crediting period that the quantity of available biomass in the region (e.g., 50 km radius), is at least 25% larger than the quantity of biomass that is utilised including the project activity, then this source of leakage can be neglected otherwise this leakage shall be estimated and deducted from the emission reductions

B.6.2. Data and parameters fixed ex-ante

Data / Parameter:	**NCV$_{biomass,i}$**
Data unit:	TJ/tonne
Description:	Net calorific value of the non-renewable biomass that is substituted
Source of data:	IPCC Default
Value(s) applied:	0.015
Choice of data or Measurement methods and procedures:	The selection of the data is based on the recommendation by the methodology at paragraph 11 that allows the application of IPCC defaults
Purpose of data	Calculation of baseline emissions
Additional comment:	Applicable to AMS-I.E

Data / Parameter:	**f$_{NRB}$**

Data unit:	%
Description:	Fraction of non-renewable biomass
Source of data:	The data is sourced from CDM Website and approved by the country's DNA
Value(s) applied:	88%
Choice of data or Measurement methods and procedures:	As recommended by the methodology the project can use establish fNRB using survey methods or government data or approved default country specific fraction of non-renewable woody biomass (fNRB) values available on the CDM website
Purpose of data	Calculation of baseline emissions
Additional comment:	Applicable to AMS-I.E

Data / Parameter:	$Q_{biomass}$
Data unit:	tonnes
Description:	Average annual consumption of woody biomass per appliance
Source of data:	Literature
Value(s) applied:	To be specified in the specific CPA-DD
Choice of data or Measurement methods and procedures:	The methodology provides that the data is source either from historical data or estimated using survey methods. For the purpose of emission reduction this data has been sourced from credible literature
Purpose of data	Calculation of baseline emissions
Additional comment:	Applicable to AMS-I.E

Data / Parameter:	x_j
Data unit:	Fraction
Description:	A fraction representing fuel type j used by the baseline thermal applications displaced by biomass/biogas
Source of data:	Baseline description.
Value(s) applied:	To be specified in the specific CPA-DD
Choice of data or Measurement methods and procedures:	In accordance with the baseline description, kerosene is the only fossil fuel type that will be replaced by the project cook stoves. The stoves solely use (insert fuel type) as fuel and thus will replace the kerosene entirely
Purpose of data	Calculation of baseline emissions
Additional comment:	Applicable to AMS-I.I

Data / Parameter:	$EF_{FF,J}$
Data unit:	tCO_2/GJ
Description:	CO_2 emission factor of fuel type j used by the baseline thermal applications displaced by biomass
Source of data:	IPCC default value
Value(s) applied:	To be specified in the specific CPA-DD
Choice of data or Measurement methods and procedures:	As conservative approach the IPCC emission factor default value for kerosene has will be been selected for calculation of ex-ante emission reductions
Purpose of data	Calculation of baseline emissions
Additional comment:	Applicable to AMS-I.I

Data / Parameter:	η_{PJ}
Data unit:	Dimensionless
Description:	Efficiency of the project stove
Source of data:	Manufactures specification
Value(s) applied:	To be specified in the specific CPA-DD
Choice of data or Measurement methods and procedures:	The ratio has been derived from credible manufactures specification of the stoves
Purpose of data	Calculation of baseline emission
Additional comment:	Applicable to AMS-I.I

Data / Parameter:	η_{BL}
Data unit:	Dimensionless
Description:	Efficiency of baseline stove
Source of data:	Literature data
Value(s) applied:	To be specified in the specific CPA-DD
Choice of data or Measurement methods and procedures:	To be specified in the specific CPA-DD
Purpose of data	Calculation of baseline emission
Additional comment:	Applicable to AMS-I.I

B.6.3.   Ex-ante calculations of emission reductions

The ex-ante emission reductions estimates will be based on the combined application of methodologies AMS-I.E '*Switch from non-renewable biomass for thermal application by the user*' *version 06.0* and AMS-I.I *'Biogas/biomass thermal applications for households/small users'* version *04.0*

The emissions reduction will be calculated separately following the methodology and aggregated for the CPA-DD as follows:

Emission Reductions from the use of non-renewable biomass – Application of AMS-I.E

Emission reductions from the use of non-renewable biomass is estimated using AMS-I.E version 06.0

Baseline emissions

Equation 1 of the methodology will be used to estimate the baseline emissions

$$ER_y = B_y \times f_{NRB,y} \times NCV_{biomass} \times EF_{projected\_fossil\_fuel} - PE_{BC,y}$$

Where

Parameter	Description	Value	SI Unit	Source
ER_y	Emission reduction per appliance during the year y	insert	tCO2eq	Calculated
B_y	Quantity of woody biomass that is substituted or displaced per appliance/ household in tonnes	insert	tonnes/yr	Calculated
$f_{NRB,y}$	Fraction of non-renewable biomass used in the absence of the project activity in year y that can be established as non-renewable biomass using survey methods or government data or approved default country specific fraction of non-renewable woody biomass (f_{NRB}) values available on the CDM website	insert	fraction	CDM Website
$NCV_{biomass}$	Net calorific value of the non-renewable biomass that is substituted	0.015	TJ/tonne	IPCC default
$EF_{projected\_fossil\_fuel,y}$	Emission factor for the substitution of non-renewable woody biomass by similar.	81.6	tCO2/TJ	Methodology default
$PE_{BC,y}$	Project emission due to cultivation of biomass	0	tCO2eq	Calculated
Leakage	Net Gross Factor accounting for leakage	0.95	-	Methodological default

Determination of B_y

$$By = Q_{biomass} * N_{k,0} * n_{k,y} * P_{non-renewable}$$
Where

Parameter	Description	Value	SI Unit	Source
B_y	Quantity of woody biomass that is substituted or displaced per appliance/household in tonnes per year	Insert	tonnes/yr	Calculated
$Q_{biomass}$	Average annual consumption of woody biomass per appliance/household.	Insert	tonnes/yr	Calculated based on Literature data as shown in the emission reduction spread sheet
$N_{k,0}$	Number of cook stoves distributed by	Insert	Number	Project developer

	the CPA in year 1			
$P_{non-renewable}$	Proportion of distributed cook stoves that are displacing non-renewable biomass	Insert	Percentage	Calculated
$n_{k,y}$	Proportion of distributed cook stoves that remain operational in year 1 of operation	Insert	Percentage	Assumed based on the manufactures specification on the cook stove lifetime

Project emissions (PE_{BC,y})

No project emissions will be accounted for, as the project does not involve the cultivation of biomass

Thus:

$PE_{BC,y}=0$

Leakage

Leakage shall be accounted for by multiplying By with a net gross factor of 0.95 for the use/diversion of non-renewable woody biomass saved under the project activity by non-project household/users that previously used renewable energy sources. .

The methodological tool: *Leakage in biomass small-scale project activities version 04 (EB 83 Annex 15* shall be followed (where applicable) to quantify leakages pertaining to the use of biomass residues.

The calculation is as shown in the equation below:

Net Emission Reductions = Emission Reductions per cook stove* Number of appliances– Leakage from biomass residues- 0

Emission reduction from the use of fossil fuel - Application of AMS-I.I

Emission reductions from the displacement of fossil fuels are calculated based **on AMS-I.I *version 04.0.*** The calculation is based on the thermal energy generated using the measured quantity of biomass using equation 4 of the methodology as follows:

$$ER_y = \sum_k N_{k,0} * n_{k,y} * BS_{k,y} * EF * \eta_{PJ/BL} * NCV_{biomass} - LE_y$$

Where:

Parameter	Description	Value	SI Unit	Source
$N_{k,0}$	Number of thermal applications *k* commissioned	Insert	Number	Insert
$\eta_{k,y}$	Proportion of $N_{k,0}$ that remain operating at year y (fraction)	Insert	Fraction	Insert
$BS_{k,y}$	The net quantity of renewable biomass or biogas consumed by the thermal application k in year y (mass or volume units, dry basis)	Insert	Mass or volume units, dry basis)	Calculated/Literature
EF	CO2 emission factor (tCO2/GJ) $$EF = \sum_j x_j * EF_{FF,j}$$ Where:	Insert	tCO2/GJ	Calculated

	x j is a fraction representing fuel type j used by the baseline thermal applications displaced by biomass/biogas			
$\eta_{PJ/BL}$	Ratio of efficiencies of project equipment and baseline equipment (e.g. cook stove using coal) measured once prior to validation applying the same test procedure (e.g. lab test), as per a national or an international standard. Official data or scientific literature can be used for cross-check purposes	Insert	Fraction	Calculated
$NCV_{biomass}$	Net calorific value of the biomass (GJ/unit mass or volume, dry basis)	Insert	GJ/tonne	Insert
P_{FF}	Proportion of Cook stoves displacing kerosene in Ethiopia	Insert	Fraction	Calculated/literature

Leakage emissions (LE)

The project equipment will not be transferred out of the project boundary and so no leakage emissions are to be accounted based on paragraph 15 of the methodology, which states that 'If the energy generating equipment introduced by the project activity is transferred from outside the boundary to the project activity, leakage is to be considered.

The methodological tool: *Leakage in biomass small-scale project activities version 04 (EB 83 Annex 15* shall be followed (where applicable) to quantify leakages pertaining to the use of biomass residues where applicable.

Net Emission Reductions= (Emission Reductions per appliance* Number of appliances) – Leakage emissions

Total emission reductions = Emission Reductions from AMS-I.E + Emissions Reductions from AMS-I.I

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:	$Q_{renewable\ biomass}$ and $BS_{k,y}$
Data unit:	tonnes/yr
Description:	The net quantity of renewable biomass consumed by the thermal application *k* in year *y* (mass or volume units, dry basis)
Source of data:	Historical data for ex-ante estimation and survey results for ex-post estimation
Value(s) applied	To be specified in the CPA DD
Measurement methods and procedures:	This will be measured through surveys carried out during monitoring. Interviews will be carried out on the selected households to be surveyed. The surveys will satisfy 90/10 confidence precision level when done annually and 95/10 when carried out biennially. The CME or third party contracted to carry out the survey will visit the households that contain the selected stoves Through interviewing the end-user of the stove the surveying entity will capture the amount of [Insert fuel type] that the end-user consumes per day or per week. This value shall be reciprocated for the whole year for the sampled end-users and a mean derived out of it to be used for ex-post emission reductions. The interviews will only be carried out on households that the project stove is found to be in operation.
Monitoring frequency:	Annually or Biennial

QA/QC procedures:	The data collected shall be transferred from the surveying entity to the CME in cases where its not the CME carrying out the survey. The data shall be checked for any inconsistency that might lead to biased results and rectified. Depending on the frequency of monitoring the sample results will be required to attain a set precision. In case the required precision is not attained then the surveying entity will apply the reliability procedures described under the monitoring plan. When biennial inspection is chosen, a 95% confidence interval and 10% margin of error requirement shall be achieved for the sampling parameter on other hand, when the project proponent chooses to inspect annually, a 90% confidence interval and 10% margin of error requirement shall be achieved for the sampling parameter. In the case where the confidence precision level is not reached oversampling will be carried out to achieve this from a buffer sample that will have been calculated during sample drawing otherwise the lower bound of a 90 per cent or 95 per cent confidence interval of the parameter value may be chosen as alternative to repeating the survey efforts.
Purpose of data	Calculation of baseline emissions
Additional comment:	Applicable for AMS-I.E and AMS-I.I

Data / Parameter:	**$NCV_{biomass}$**
Data unit:	GJ/ mass or volume unit
Description:	Net calorific value of the biomass type
Source of data:	Laboratories tests carried out by the CME according to relevant international standards
Value(s) applied	To be specified in the specific CPA DD
Measurement methods and procedures:	The parameter shall be monitored through sampling where a sample size shall be calculated as described in of monitoring plan section. The sample size will satisfy a 90/10 confidence precision level. The CME or contracted third part will visit the selected households for surveys A sample of [insert fuel] from households where the project appliance has been found to be in operation shall be collected and a lab analysis carried out. The lab analysis shall meet international standards. Based on the results, an average shall be calculated and shall be used for ex-post emission reductions. Where necessary, the amount of ethanol that will be taken to be tested will be replaced with the same amount of ethanol from the CME to avoid cases of non-response as a result of the end-users getting a loss.
Monitoring frequency:	Annually
QA/QC procedures:	The tests done on the renewable biomass used by the stoves shall be confirmed to meet national/international standards. This shall be confirmed by the CME or the third party entity contracted to perform the tests. The sample results will meet the required precision level and in case they do not then the reliability test shall be conducted. The consistency of the measurements shall be checked by comparing the measurement results with measurements from previous years, relevant data sources (e.g. values in the literature, values used in the national GHG inventory) and default values by the IPCC

Purpose of data	Calculation of baseline emissions
Additional comment:	Applicable for the methodology AMS-I.I version 04.0

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Data / Parameter:	$N_{k,0}$
Data unit:	Dimensionless
Description:	Number of thermal applications k commissioned
Source of data:	Records of installation date of each system
Value(s) applied	To be specified in the specific CPA-DD
Measurement methods and procedures:	At the time of installation all project activity systems shall be inspected and undergo acceptance testing (commissioning) for proper operation by qualified personnel in compliance with specifications. Proper operation of the cook stoves shall be confirmed and evidenced through a signed delivery note between the end-user and the CPA Implementing Entity. The records will be archived a in project data base which will capture the following: • The customer address • Sales date of the stove • Phone number if applicable • Stoves serial number • The baseline stoves
Monitoring frequency:	Continuous
QA/QC procedures:	All project activity systems shall be inspected and undergo acceptance testing (commissioning) for proper operation in compliance with specifications. The serial numbers of the stoves captured in the distribution will be counter checked with the serial number of the stoves from the batch to make sure that the serial number is well captured,
Purpose of data	Calculation of baseline emissions
Additional comment:	Applicable for the methodology AMS-I.I version 04.0 and AMS I.E version 06.0. For the methodology AMS I.E this parameter is used to calculate the parameter By (the quantity of woody biomass that is substituted or displaced in tonnes).

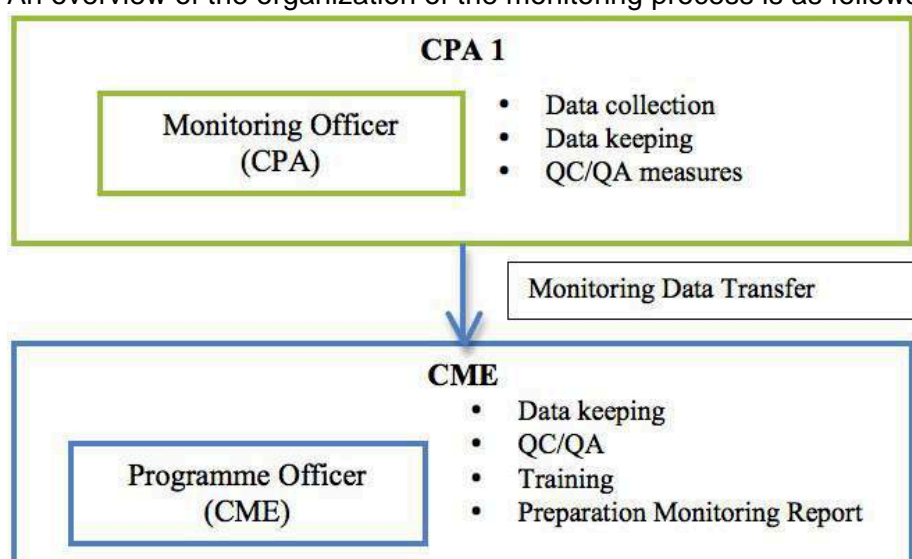| Data / Parameter:	$n_{k,y}$
Data unit:	Fraction
Description:	Proportion of $N_{k,0}$ that remain operating at year y
Source of data:	Stove inspections to determine if they are still operational through sampling annually or biennially
Value(s) applied	To be specified in the specific CPA-DD
Measurement methods and procedures:	The parameter shall be measured by way of sampling where a sample size shall be calculated based on 95/10 or 90/10 confidence precision level The CME or third party contracted to carry out the survey will visit the households in which the selected stoves are located and through visual inspections of the stoves. The proportion of stoves that are still operating shall be determined by relating the stoves operating to the stoves surveyed The CME or third party contracted to carry out the survey will capture the type of stove that was used by the end-user prior to acquiring the project stove. This will be used to determine which type of fuel the stove replaced i.e. either fossil fuel of non-renewable biomass. Based on the proportion of stoves replaced the population shall be classified based on the fuel replaced. When sampling is done on annual basis the survey will meet 90/10 confidence precision level and 95/10 confidence precision level shall be chosen, when surveys are done biennially.

Monitoring frequency:	At least once every two years (biennial) during the crediting period or annually
QA/QC procedures:	The data collected shall be transferred from the surveying entity to the CME in cases where its not the CME carrying out the survey. The data shall be checked for any inconsistency that might lead to biased results and rectified. Depending on the frequency of monitoring the sample results will be required to attain a set precision. In case the required precision is not attained then the surveying entity will apply the reliability procedures described under the monitoring plan. When biennial inspection is chosen, a 95% confidence interval and 10% margin of error requirement shall be achieved for the sampling parameter on other hand, when the project proponent chooses to inspect annually, a 90% confidence interval and 10% margin of error requirement shall be achieved for the sampling parameter. In the case where the confidence precision level is not reached oversampling will be carried out to achieve this from a buffer sample that will have been calculated during sample drawing
Purpose of data	Calculation of baseline emissions
Additional comment:	Applicable for the methodology AMS-I.I version 04.0 and AMS I.E version 06.0. For the methodology AMS I.E this parameter is used to calculate the parameter By (the quantity of woody biomass that is substituted or displaced in tonnes).

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

Operational and management structure

The overall responsibility for monitoring of the Project Gaia Cook Stove Programme of Activities will rest with Project Gaia Inc. as the CME.The CME will ensure that each CPA is implemented and monitored as described in the PoA-DD and CPA-DD. In order to achieve this, the CME will enter into a contractual agreement with each CPA implementing entity prior to the CPA inclusion into the PoA. The contract will outline the roles and responsibilities of the CME and CPA Implementing Entity in order to ensure a smooth implementation and monitoring of the CPA. Third Party entities will also be outsourced to facilitate the monitoring of the CPA if need be and they will also get into a contract with the CME

An overview of the organization of the monitoring process is as follows:

Responsibilities of the CME

Once a DOE has approved the inclusion of a CPA and the project activity has begun operations, the CME will take charge of the following:
- Receiving and compiling monitoring records from the CPA implementing entity
- Archiving and keeping monitored data for two years after the end of the crediting period or the last issuance of CERs, whichever occurs later.
- Coordinating monitoring activities and data management during the lifetime of the PoA.
- Contracting a DOE for validation and verification purposes.
- Preparing and submitting monitoring reports and facilitating the verification of the same.
- Acting as the focal point with the CDM Executive Board for matters related to the PoA.
- During the lifetime of the PoA, maintaining all monitoring reports of all CPAs.
- Provide training as required to the CPA implementer's staff that will work on the monitoring of parameters relevant to the emission reduction assessment of the CPA.

The CME will further be responsible for ensuring that the CPA Implementer understands the requirements of the monitoring plan. The CME Programme Manager/Officer in charge will maintain regular communication with the CPA Implementer's staff.

CPA monitoring training

Before the implementation of the CPA or the start of the CPA crediting period, the CME will provide training and guidance regarding the implementation of the CPA monitoring plan to the CPA Implementer's staff. The training will include the following components:
- CDM Project Cycle and the significance of monitoring
- Management structure and work scope
- Components of the monitoring plan
- QA/QC procedures
- Monitoring report template
- Preparation for verification
- Questions and answers

The CME will ensure that the training materials provided to the CPA Implementer for monitoring will be regularly updated in line with changes to the CDM or PoA requirements. The relevant Programme Manager/Officer will responsible for updating the training materials.

The CME will maintain an electronic database that will incorporate the monitored parameters and values required in emission reduction calculations for each CPA, as well as other relevant information. The database will ensure that monitored data is kept and archived for two years after the end of the crediting period or the last issuance of CERs, whichever occurs later.

Responsibilities of the CPA implementer

CPA Implementers will be responsible for the implementation of individual CPAs under the PoA and will also be in charge of:
- Operations and maintenance of the CPA for the duration of the project.
- Record keeping of parameters as per the monitoring plan and provide hard and electronic records to the CME on a regular basis.
- Make available staff for any training conducted by the CME on monitoring approaches and systems.
- Make staff available for validation and verification where applicable.
- Provide the DOE with required documents and access to sites as needed.

More specifically, the CPA implementer will be responsible for the technical aspects related to monitoring activities such as:
- Employment and training of personnel responsible for gathering and recording monitoring data

- Continuous record keeping of the number of cook stoves and the dates when they were distributed to end-users.
- Ensure that the stoves are in good working condition before the transfer of ownership is made to the end-users.
- Ensure that the end-users are well trained on the proper operation of the cook stoves before the transfer of ownership is made. This might be in the form of user manuals, one-on-one training sessions or any other appropriate methods.
- Ensure that the end users are well aware of the emergency procedures and the contact persons in case of such emergencies. This might be in the form of user manuals, warranty cards or any other appropriate methods.
- Continuous record keeping of the number and date when cook stoves have been replaced or serviced.
- If the CPA implementing entity will also distribute fuel to be used to the end-users, ensure continuous recording of the amounts of fuel distributed.
- Incase the CPA implementing entity does not distribute fuel to end-users, the CPA in liaison with the CME will estimate the amounts of fuel distributed to end-users through an appropriate sampling method as further described in the sampling plan.
- Contracting a survey company where needed
- Electronic archiving of all monitored data and parameters.
- Submission of monitoring data to the CME on a regular basis.

As such, the CPA will appoint a monitoring officer who will be in charge of the CPA's monitoring responsibilities as described above. The records will be crosschecked for consistency by another employee of the CPA who is not directly in charge of data recording and finally approved by the director of the CPA. The CPA will thereafter submit on a regular basis, the monitored records to the CME accompanied by the respective copy of records/invoices for sold units as evidence.

Data and parameters to be monitored

The following data and parameters will be monitored as required by the two methodologies AMS-I.E and AMS-I.I

Parameter	Description	Monitoring / recording frequency
$Q_{renewable\ biomass}$	The net quantity of renewable biomass consumed by the thermal application k in year y	At least once every two years. (biennial) during the crediting period)
$N_{k,0}$	Number of thermal applications k commissioned	At the time of installation all project activity systems shall be inspected and undergo acceptance testing (commissioning) for proper operation in compliance with specifications. The installation date of each system shall be recorded as soon as it is sold.
$n_{k,y}$	Proportion of Nk,0 that remain operating at year y (fraction)	At least once every two years (biennial) during the crediting period
$BS_{k,y}$	The net quantity of renewable biomass or biogas consumed by the thermal application k in year y	At least once every two years (biennial) during the crediting period
$NCV_{biomass}$	Net calorific value of biomass type (insert fuel)	Annually

Sampling Plan

In accordance to the applied methodologies, AMS.I.E ver 6.0 and AMS-I.I ver 4.0, a statistically valid sample of the locations where the systems are deployed, with consideration, in the sampling design, of occupancy and demographics differences can be used to determine parameter values used to determine emission reductions, as per the relevant requirements for sampling in the "Standard for sampling and surveys for CDM project activities and programme of activities". When

biennial inspection is chosen a 95 per cent confidence interval and a 10 per cent margin of error requirement shall be achieved for the sampling parameter. On the other hand when the project proponent chooses to inspect annually or the methodology dictates so, a 90 per cent confidence interval and a 10 per cent 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 per cent or 95 per cent confidence interval of the parameter value may be chosen as an alternative to repeating the survey efforts to achieve the 90/10 or 95/10 precision or rather discounting the emission reductions by not less than 3 times the percentage of missed precision during the first two years of the crediting period of the CPA as outlined and recommended by the "Standard for Sampling and surveys for CDM project activities and programme of activities" ver 04.1 paragraph 16

Methodology AMS-I.E ver 6.0 specifically requires that:

- Monitoring shall consist of checking of all appliances or a representative sample thereof, at least once every two years (biennial) to ensure that they are still operating or are replaced by an equivalent in service appliance.
- Monitoring should confirm the displacement or substitution of the non-renewable woody biomass at each location. In the case of appliances switching to renewable biomass the quantity of renewable biomass used shall be monitored. For this, project proponents may apply the "Standard for sampling and surveys for CDM project activities and programme of activities".

Parameters to be sampled under methodology AMS-I.E are provided in the table below:

Parameter	Description
$n_{k,y}$	Proportion of distributed units that remain operational at least once in two years.
$Q_{\text{renewable biomass}}$	The net quantity of renewable biomass consumed by the thermal application k in year y

Likewise, AMS-I.I ver 4.0 specifically requires that:

- At the time of installation all project activity systems shall be inspected and undergo acceptance testing (commissioning) for proper operation in compliance with specifications. The installation date of each system shall be recorded.
- According to the methodology, emission reductions can only be applied to systems that are demonstrated to be operational and in compliance with manufacturer required maintenance procedures, at least once every two years (biennial) during the crediting period. In order to determine this, a statistically valid sample of the residences where the systems are installed, can be used to determine the percentage of systems operating. The only exception to carrying out an actual site visit is where there are on-going rental/lease payments or a recurring maintenance fee by users.

Parameters to be sampled under AMS-I.I are provided in the table below:

Parameter	Description
$n_{k,y}$	Proportion of $N_{k,0}$ that remain operating at year y (fraction)
$BS_{k,y}$	The net quantity of renewable biomass consumed by the thermal application k in year y
$NCV_{biomass}$	Net calorific value of biomass type (insert fuel)

In order to ensure that parameter values obtained through sampling are non biased and that data collection minimizes non-sampling (non-random, systematic) errors, the CPA will observe sound practices in designing samples and administering surveys and field measurements as outlined in the "Guidelines for sampling and surveys for CDM project activities and programme of activities"

and estimation of sample size will be guided by the type of parameter being sampled that it either proportion parameter or mean parameter.

Sampling design

Sampling design shall be based on the methodologies and the nature of the sampled parameter

Sampling design to be employed for sampling parameters under methodology AMS-I.E

(i) Objectives and Reliability Requirements

The objective of the sampling effort will be to assess the number of distributed units that are still in operation and the amount of renewable biomass used by the appliances. The sample size results will meet either a 90% confidence and a 10% precision level when monitoring is carried out annually and a 95% confidence and 10% precision level when monitoring is done once in two years as described under methodology AMS-I.E.

The parameters to be sampled are as shown below together with the confidence precision level target

Parameter	Descriptions	Confidence/precision
$n_{k,y}$	Proportion of distributed units that remain operational at least once in two years.	Annually 90/10 Biennial 95/10
$Q_{renewable\ biomass}$	The net quantity of renewable biomass consumed by the thermal application k in year y	Annually 90/10 Biennial 95/10

ii) Target Population

The target population will be households/communities/SMEs in which the cook stoves have been distributed as identified by the CME sales records.

(iii) Sampling method

The PoA will employ simple random sampling method, as the population targeted is homogeneous in nature based on the following:

- Technology implemented: The CPA will involve the distribution of cook stoves of the same technology and specification in terms of fuel used and efficiency of the stoves as specified by the manufacturer
- End-users: The end-users to whom the stoves will be distributed will be similar in nature that is they will be will be households
- Boundary covered by the stoves: Stoves distributed will be within the confinement of the CPA boundary as defined in the project boundary.

Sampling will be done on single CPA basis and can be carried out across CPA's as long as homogeneity of the CPAs is established based on the above criteria.

A sample will be selected from population contained in a specific CPA based on calculation procedures indicated in the guidelines of sampling and surveys and through application of a random number generator. The selected stoves location will be visited by the CME or a third party hired to carry out the survey. Each stove will be uniquely identified through its serial number.

The survey of the monitored parameters will involve the following

Parameter	Process of carrying our the survey
$n_{k,y}$	The CME or third party contracted to carry out the survey will visit the households in which the appliances have been distributed and through visual inspections of the stoves the proportion of stoves that are still operating shall be determined by relating the stoves operating to the stoves surveyed.
	The CME or third party contracted to carry out the survey will capture the type of stove that was used by the end-user prior to acquiring the project stove. This will be used to determine which type of stove and fuel the project stove replaced i.e. either fossil fuel powered stove or fuel wood stove. Based on the proportion of stoves replaced the population shall be classified based on the baseline fuel replaced by the project appliance.
$Q_{renewable\ biomass}$	The CME or third party contracted to carry out the survey will visit the households that have the selected stoves from the sample size calculation. Through interviewing the end-user of the stove the surveying entity will capture the amount of [Insert fuel type] that the end-user consumes per day or per week. This value shall be extrapolated for the whole year for the sampled end-users and a mean derived out of it to be used for ex-post emission reductions.
	The interviews for this parameter will only be carried out on households that the project stove is found to be in operation.

In order to make sure that reliability is met, oversampling of 30% will be carried out on the initial calculated sample size to cater for non-response. The oversampling has been chosen based on similar projects. A buffer list will also be created which will include the stoves to be chosen incase the reliability is not met on the first survey exercise. The buffer will be at least 30% of the calculated sample size of the parameter.

The use of buffer in meeting the reliability of the sample will be carried out in stages. Where 10% will first be drawn as additional stoves to be monitored followed by another 10% then if need be the whole 30%. The CME will draw samples from each CPA

iv)   Sample size calculation

The formula to be used for calculation of the sample size will depend on the type of parameter being sampled i.e. whether the parameter is a proportion/percentage parameter or if the parameter of interest is a mean.

Sample size calculation for $n_{k,y}$

Calculation for $n_{k,y}$ will be calculated following equation (1) para 15 of appendix 2 of the *Guidelines: sampling and surveys for CDM Project Activities and Programme of Activities version 03.0*

$$n \geq \frac{1.96^2 N \times p(1-p)}{(N-1) \times 0.1^2 \times p^2 + 1.96^2 p(1-p)}$$

nk,y	Proportion of appliances that remain operational

Where	
n	Sample size
N	Total population
p	Expected proportion of cook stoves that are still in operation
1.96	Represents 95% confidence required when biennial survey is chosen. When annual survey is selected 1.645will be value used for sample size calculation as

	shown on sample size calculation spreadsheet.
0.1	Represents 10% precision level on both sides of p,

Required data for calculation of the sample size

Parameter	Source
N	Sales records of stoves that have been sold determined per CPA distribution
p,	Based on developers own experience or from similar CDM projects

For ex-ante estimation the following data shall be used for calculation of expected sample size for $n_{k,y}$

Data	Value	Source
N	[Insert]	Based on the number of stoves expected to be distributed until the first date of monitoring
p,	[Insert]	Based from similar CDM cook stoves projects
n	[Insert]	Calculated
Oversampled size of 30%	[Insert]	Calculated

If the calculation of the sample size returns a value of less that 30 then the surveyor will apply a sample size of 30 as recommended by the Standard Sampling and surveys for CDM project activities and programme of activities version 04.1

Sample size calculation for Q_{renewable biomass}

Q_{renewable biomass} being a mean parameter the sample size calculation will be based on equation (4) paragraph 27 of appendix 2 of the '*Guidelines: sampling and surveys for CDM Project Activities and Programme of Activities version 03.0*'

$$n = \frac{1.96^2 NV}{(N-1) \times 0.1^2 + 1.96^2 V}$$

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

Where:

n	Sample size
N	Total number of population
V	Variance
SD	Expected standard deviation
0.1	Precision
1.96	Represents the 95% confidence required when biennial survey is chosen. When annual survey is selected 1.645will be value used for sample size calculation as shown on sample size calculation spreadsheet.
Mean	Expected mean

Required data for calculation of the sample size

Parameter	Source
N	CME sales records
SD	Estimated

Mean	Based on project proponent experience

For ex-ante estimation the following data shall be used for calculation of expected sample size for $Q_{renewable\ biomass}$

Data	Value	Source
N	[Insert]	Based on the number of stoves expected to be distributed until the date of first monitoring
SD	[Insert]	Conservatively estimated
Mean	[Insert]	Estimated based on project proponent experience
Sample size n	[Insert]	Calculated
Oversampling n	[Insert]	Calculated

If the calculation of the sample size returns a value of less that 30 then the surveyor will apply student t-distribution since the parameter of interest is a mean as recommended by the Standard Sampling and surveys for CDM project activities and programme of activities version 04.1. The sample size of this parameter shall be calculated based on the type of stove i.e single burner or double burner

Reliability for sampling results

Depending on the monitoring frequency the sample size will be expected to reach either 90/10 confidence precision level for annual monitoring or 95/10 for the case of biennial monitoring.
In case the sample will not attain the required precision the following options shall be used depending on which is appropriate as recommended by Standard Sampling and surveys for CDM project activities and programme of activities version 04.1

- Perform additional data collection that is a supplemental or new sample to reach the required precision level; or
- Apply a correction to the estimates using the options below:

    (i) Discounting the emission reduction estimates by either,
        a. Taking the lower or the upper bound, whatever is conservative, of the 90 or 95 per cent confidence interval, depending on the type of methodologies applied; or

        b. Discounting by no less than three times (x3) the percentage precision points missed (e.g. if the attained precision is 90/11 then the emission reduction estimates are discounted by 3 per cent)

Sampling design to be employed for sampling parameters under methodology AMS-I.I

(i) Objectives and Reliability Requirements

The objective of the sampling effort will be to assess the number of distributed units that are still in operation, the amount of renewable biomass used by the appliances and the net calorific value of the renewable biomass used by the stoves. The sample size results will meet either a 90% confidence and a 10% precision level when monitoring is carried out annually or a 95% confidence and 10% precision level when monitoring is done once in two years as described under methodology AMS-I.I.

The parameters to be sampled are as shown below together with the confidence precision level target

Parameter	Descriptions	Confidence/precision
$n_{k,y}$	Proportion of $N_{k,0}$ that remain operating at year y (fraction)	Annually 90/10 Biennial

		95/10
$BS_{k,y}$	The net quantity of renewable biomass consumed by the thermal application k in year y	Annually 90/10 Biennial 95/10
$NCV_{biomass}$	Net calorific value of biomass type (==insert fuel==) and satisfies a 90/10 confidence precision level	Annually 90/10

ii) Target Population

The target population will be households/communities/SMEs in which the cook stoves have been distributed as identified by the CME sales records.

(iii) Sampling method

The PoA will employ simple random sampling method, as the population targeted is homogeneous in nature based on the following

- Technology implemented: The CPA will involve the distribution of cook stoves of the same technology and specification in terms of fuel used and efficiency of the stoves as specified by the manufacturer
- End-users: The end-users to whom the stoves will be distributed will be similar in nature that is they will be will be households
- Boundary covered by the stoves: Stoves distributed will be within the confinement of the CPA boundary as defined in the project boundary.

Sampling will be done on single CPA basis and can be carried out across CPAs as long as homogeneity of the CPAs is established based on the above criteria.

A sample will be selected from population contained in a specific CPA based on calculation procedures indicated in the guidelines of sampling and surveys and through application of a random number generator. The selected stoves location will be visited by the CME or a third party hired to carry out the survey. Each stove will be uniquely identified through its serial number.

The survey of the monitored parameters will involve the following

Parameter	Process of carrying our the survey
$n_{k,y}$	The CME or third party contracted to carry out the survey will visit the households in which the appliances have been distributed and through visual inspections of the stoves the proportion of stoves that are still operating shall be determined by relating the stoves operating to the stoves surveyed.
	The CME or third party contracted to carry out the survey will capture the type of stove that was used by the end-user prior to acquiring the project stove. This will be used to determine which type of stove and fuel the project stove replaced i.e. either fossil fuel powered stove or fuel wood stove. Based on the proportion of stoves replaced the population shall be classified based on the baseline fuel replaced by the project appliance.
$BS_{k,y}$	The CME or third party contracted to carry out the survey will visit the households that have the selected stoves from the sample size calculation. Through interviewing the end-user of the stove the surveying entity will capture the amount of [==Insert fuel type==] that the end-user consumes per day or per week. This value shall be extrapolated for the whole year for the sampled end-users and a mean derived out of it to be used for ex-post emission reductions.
	The interviews for this parameter will only be carried out on households that the project stove is found to be in operation.
$NCV_{biomass}$	The parameter shall be monitored through sampling where a sample size shall be calculated that satisfies a 90/10 confidence precision level. The CME or contracted third part will visit the selected households for surveys.
	A sample of the fuel will be taken from households where the project appliance has been found

	to be in operation and lab analysis carried out.
	Based on the results, an average shall be calculated and shall be used for ex-post emission reductions.
	Where necessary, the amount of ethanol that will be taken to be tested will be replaced with the same amount of ethanol from the CME to avoid cases of non response as a result of the end-users getting a loss.

In order to make sure that reliability is met, oversampling of 30% will be carried out on the initial calculated sample size to cater for non-response. The oversampling has been chosen based on similar projects. A buffer will also be created which will include the stoves to be chosen incase the reliability is not met on the first survey exercise. The buffer will be at least 30% of the calculated sample size of the parameter.

The use of buffer in meeting the reliability of the sample will be carried out in stages. Where 10% will first be drawn as additional stoves to be monitored followed by another 10% then if need be the whole 30%. The CME will draw samples from each CPA

v) Sample size calculation

The formula to be used for calculation of the sample size will depend on the type of parameter being sampled i.e. whether the parameter is a proportion/percentage parameter or if the parameter of interest is a mean.

Sample size calculation for $n_{k,y}$

Calculation for $n_{k,y}$ will be calculated following equation (1) paragraph 15 of the *'Guidelines: sampling and surveys for CDM Project Activities and Programme of Activities version 03.0'*

$$n \geq \frac{1.96^2 N \times p(1-p)}{(N-1) \times 0.1^2 \times p^2 + 1.96^2 p(1-p)}$$

$n_{k,y}$	Proportion of $N_{k,0}$ that remain operating at year *y* (fraction)

Where:	
n	Sample size
N	Total population
p	Expected proportion of cook stoves that are still in operation
1.96	Represents 95% confidence required when biennial survey is chosen. When annual survey is selected 1.645 will be value used for sample size calculation as shown on sample size calculation spreadsheet.
0.1	Represents 10% precision level on both sides of p

Required data for calculation of the sample size

Parameter	Source
N	Sales records of stoves that have been sold determined per CPA distribution
p	Based on developers own experience or from similar CDM projects

For ex-ante estimation the following data shall be used for calculation of expected sample size for $n_{k,y}$

Data	Value	Source

N	[Insert]	Based on the number of stoves expected to be distributed until the date of first monitoring
p	[Insert]	Based from similar CDM cook stoves projects
n	[Insert]	Calculated per vintage year (calendar year)
Oversample size of 30%	[Insert}	Calculated

If the calculation of the sample size returns a value of less that 30 then the surveyor will apply a sample size of 30 as recommended by the *Standard Sampling and surveys for CDM project activities and programme of activities version 04.1*

Sample size calculation for $BS_{k,y}$

$BS_{k,y}$ being a mean parameter the sample size calculation will be based on equation (4) paragraph 27 of the '*Guidelines: sampling and surveys for CDM Project Activities and Programme of Activities version 03.0.*

$$n = \frac{1.96^2 NV}{(N-1) \times 0.1^2 + 1.96^2 V}$$

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

Where:

n	Sample size
N	Total number of population
V	Variance
SD	Expected standard deviation
0.1	Precision
1.96	Represents the 95% confidence required when biennial survey is chosen. When annual survey is selected 1.645 will be value used for sample size calculation as shown on sample size calculation spreadsheet.
Mean	Expected mean

Required data for calculation of the sample size

Data	Source
N	CME sales records
SD	Conservatively estimated
Mean	Based on project proponent experience

For ex-ante estimation the following data shall be used for calculation of expected sample size for $BS_{k,y}$

Data	Value	Source
N	[Insert]	Based on the number of stoves expected to be distributed until the date of first monitoring
SD	[Insert]	Conservatively estimated
Mean	[Insert]	Projects proponent own experience
Sample size n	[Insert]	Calculated
Oversampling n	[Insert]	Calculated

If the calculation of the sample size returns a value of less that 30 then the surveyor will apply student t-distribution since the parameter of interest is a mean as recommended by the *Standard Sampling and surveys for CDM project activities and programme of activities version 04.1*

Sample size calculation for $NCV_{biomass}$

$NCV_{biomass}$ being a mean parameter the sample size calculation will be based on equation (4) paragraph 27 of the *'Guidelines: sampling and surveys for CDM Project Activities and Programme of Activities version 03.0.'*

$$n = \frac{1.96^2 NV}{(N-1) \times 0.1^2 + 1.96^2 V}$$

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

Where:

n	Sample size
N	Total number of population
V	Variance
SD	Expected standard deviation
0.1	Precision
1.96	Represents the 95% confidence required when biennial survey is chosen. When annual survey is selected 1.645 will be value used for sample size calculation as shown on sample size calculation spreadsheet.
Mean	Expected mean

Required data for calculation of the sample size

Data	Source
N	CME sales records
SD	Conservatively estimated
Mean	Conservatively estimated based on international accepted values

For ex-ante estimation the following data shall be used for calculation of expected sample size for $NCV_{biomass}$

Data	Value	Source
N	[Insert]	Based on the number of stoves expected to be distributed until the date of first monitoring
SD	[Insert]	Conservatively estimated
Mean	[Insert]	Conservatively estimated based on international accepted values
Sample size n	[Insert]	Calculated
Oversampling n	[Insert]	Calculated

If the calculation of the sample size returns a value of less that 30 then the surveyor will apply student t-distribution since the parameter of interest is a mean as recommended by the *Standard Sampling and surveys for CDM project activities and programme of activities version 04.1*

Reliability for sampling results

Depending on the monitoring frequency the sample size will be expected to reach either 90/10 confidence precision level for annual monitoring or 95/10 for the case of biennial monitoring.

In case the sample will not attain the required precision the following options shall be used depending on which is appropriate as recommended by *Standard Sampling and surveys for CDM project activities and programme of activities version 04.1*

- Perform additional data collection that is a supplemental or new sample to reach the required precision level; or
- Apply a correction to the estimates using one of the options below:

  (i) Discounting the emission reduction estimates by either,
  - a. Taking the lower or the upper bound, whatever is conservative, of the 90 or 95 per cent confidence interval, depending on the type of methodologies applied; or

  - b. Discounting by no less than three times (x3) the percentage precision points missed (e.g. if the attained precision is 90/11 then the emission reduction estimates are discounted by 3 per cent)

Sampling frame

The PoA will be composed of different sampling frames based on the characteristics of the CPAs and the host country of CPA implementation.
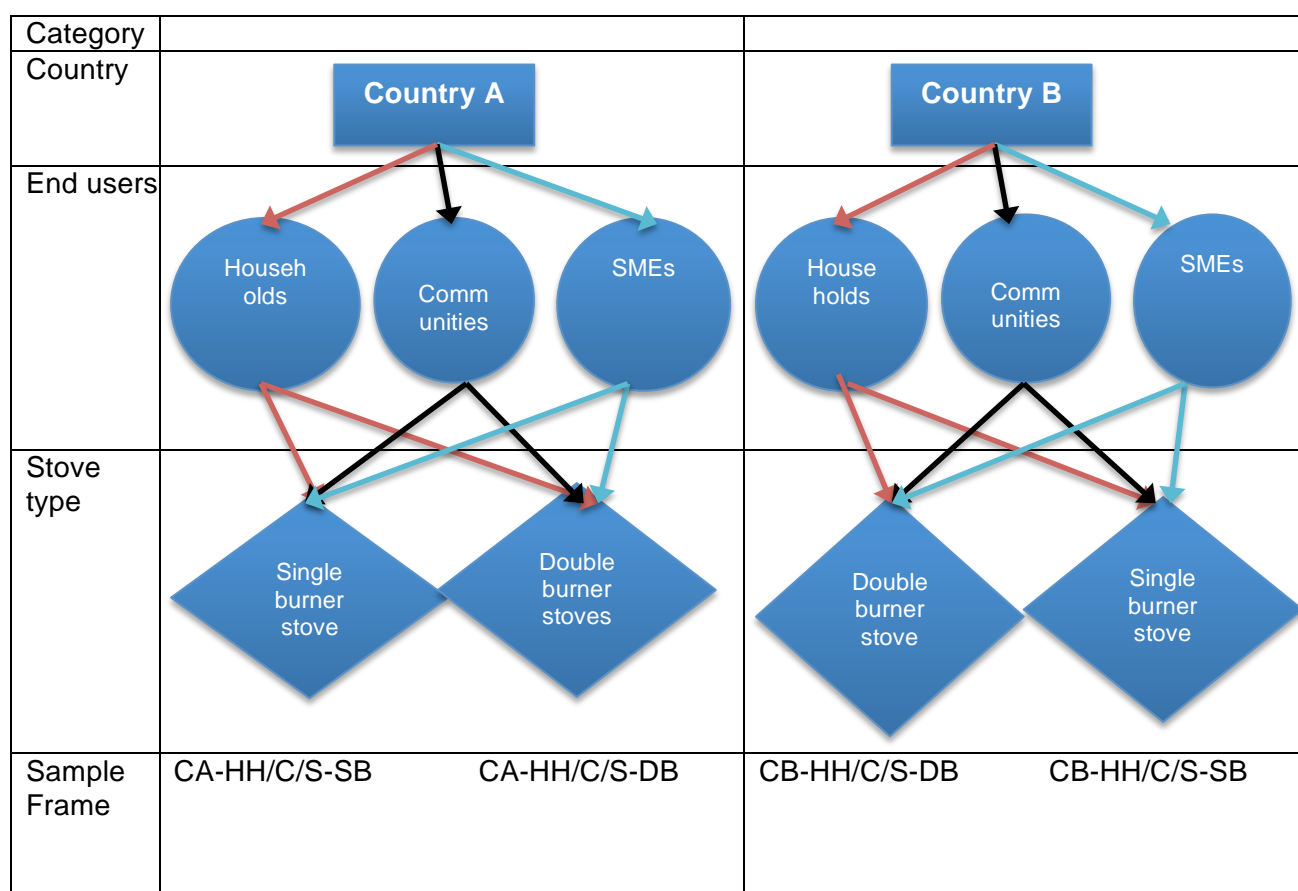
At minimal the CME will classify the sampling frame based on the below characteristics:

Country: Since the PoA is envisaged to include CPAs from different countries the sampling frame will start to be identified at the country level in that CPAs will be differentiated by country

End User: Among the eligibility criteria of the PoA is the end-users who in this case can be residential, SMEs or institutions. This will form the next differentiation of the sampling frame.

Stove type: The stoves can sufficiently be classified as homogenous due to having similar characteristic that is use of similar fuel, having the same efficiency and with the only difference of double burner and single burner stoves, which does not necessarily affect the end-user usage characteristics.

A naming system will be developed to identify the different sampling frame based on the above.

Identification of a sampling frame:

Category		
Country	Country A	Country B
End users	Households Communities SMEs	Households Communities SMEs
Stove type	Single burner stove Double burner stoves	Double burner stove Single burner stove
Sample Frame	CA-HH/C/S-SB CA-HH/C/S-DB	CB-HH/C/S-DB CB-HH/C/S-SB

The sampling frames are not fixed and may be altered from time to time with the CME in order to fit the characteristics of the CPA at hand.

Quality control /Quality assurance

In order to tackle the issue of data quality and analysis together with non-response of the end-users the CME will put in place a quality control mechanism in order to ensure that the monitoring is undertaken in a professional and conservative manner

1) **End- user awareness** at the time of sale, the end user will be made aware that they are required to participate in monitoring activities. This will be via a written statement (in English and local language where appropriate) on the carbon waiver form, or via alternative means such as training sales personnel explaining the importance of monitoring to each customer.

2) **Questionnaire design**. The design of the questionnaire will ensure that the questions are non-intrusive and easy to understand for both the interviewee and interviewer.

3) **Drawing on local knowledge.** Local third parties to be hired in each country will play an important role in tailoring the monitoring approach to suit local circumstances. For example, in some instances, it may be essential for a local person to conduct the interview in order to obtain accurate results. If the end-user needs to explain on the amount of (insert fuel) that he/she uses, the data that they provide should be as accurate as possible. For this to happen however, the question should be well understood by the end-user and the importance of the monitoring exercise too. At most times this will be well put across by a person who understands the use of local dialect.

4) **Quality of contractors**. Any third parties hired by the CME to carry out sampling of data will be required to demonstrate a high level of cultural awareness, local language skills and appropriate experience with data entry and data management. The CME will ensure that contractors are adequately trained for the tasks they are contracted. Training will also be provided on how to deal with non-responses, refusals and other problems should these occur.

If the sampling results are insufficient to achieve the target reliability levels, the CME has a number of options to address this e.g. selecting a larger than necessary sample size before commencing monitoring and having a buffer in which he can rely on in doing extra surveys.

The data contained in each individual CPA Monitoring Record and collected during field measurements will be transferred to the CME by the Monitoring Agents. Either the originals of the CPA Monitoring Records or scanned copies of each Record will also be provided to the CME to enable cross-checking. The CME will crosscheck the data provided by contractors against the original Monitoring Records)

5) **Sample size calculation**. The calculation of the sample size will be carried out using estimates for proportions, mean of values and standard deviations as the actual characteristics of the population/sampling frame are unknown ex-ante. In order to ensure the quality of the sampling results, the CME can draw on the provisions for reliability calculations as provided by Guidelines for Sampling and Surveys for CDM Project Activities and Programme of Activities. In the event that the initial sampling results do not fulfill the required level of precision, the CME will Perform additional data collection that is a supplemental or new sample to reach the required precision level; or

- Apply a correction to the estimates using one of the options below:

    (i) Discounting the emission reduction estimates by either,
        a. Taking the lower or the upper bound, whatever is conservative, of the 90 or 95 per cent confidence interval, depending on the type of methodologies applied; or

        b. Discounting by no less than three times (x3) the percentage precision points missed (e.g. if the attained precision is 90/11 then the emission reduction estimates are discounted by 3 per cent)

As a last resort, the sampling exercise may be repeated entirely with an increased sample size.

The data contained in each individual CPA monitoring record and collected during field measurements will be transferred to the CME by the Monitoring Agents. Either the originals of the CPA Monitoring Records or scanned copies of each record will also be provided to the CME to enable cross-checking.

The CME will be responsible for maintaining a secure PoA Distribution and Monitoring Database, which includes all the data relating to the CPAs within the PoA. The Database will be located on the CME's secure server. The system automatically backs up on a regular basis any files that have been modified. The files are backed up onto separate hard drives that are regularly swapped to ensure there is always one drive located securely offsite. The CME may improve this system over time with new technology.

6) **Dealing with discrepancies in data**

In cases where the surveyor based on his experiences sees that the data being provided by the end user is not true then the survey will be deemed nullified and more sample from the buffer will be drawn from the buffer selected to cater for that which has been nullified**.**

7) **Dealing with non-cooperation by the end-user**

In cases where the end-users refuses to be interviewed during monitoring, the surveyor will not force him/her to do so but rather will treat the case as non-response and will draw an extra stove from the buffer.

8) Quality check of the data

Through out the lifetime of the project the project developer will have random checks to confirm that the data entered for a specific stove is correct, this will be either through calling or having physical visitation to the end-user household.

The data to be checked will include but not limited to:

- The serial number of the stove visa vie what has been captured on the records.
- The type of stove
- The physical address
- The phone number
- The type of fuel used and the source

If this is found not to be correct the developer will correct this to avoid missing the location of the end-user during monitoring.

Data Analysis

The data obtained from sampling of each group of CPAs will be used to estimate values for the parameters described above. The values will then be factored into the emissions reduction calculations and the monitoring report for each monitoring period, and this will result in the request for issuance of CERs.

PART II.   Generic component project activity (CPA)

GENERIC CPA TYPE II: PROJECT GAIA COOK STOVE PROGRAMME OF ACTIVITIES - CPA000 [INSERT IDENTIFICATION NUMBER] DJIBOUTI

SECTION A.   General description of a generic CPA

A.1.   Purpose and general description of generic CPAs

The purpose of the generic CPA, under the **Project Gaia Cook Stove Programme of Activities (PG PoA)** is the displacement of non-renewable biomass and fossil fuel for cooking in households/communities/SMEs through the dissemination of cook stoves powered by [insert], a renewable energy source. The CPA is of the small-scale type falling under sectoral scopes: Energy industries renewable/non-renewable sources (1).

The stoves units distributed under this CPA will not exceed a total installed/rated capacity of 45MW$_{th}$ while individual stoves will have a rated capacity not exceeding 150 kW thermal. This will be confirmed through the manufacture's specifications of the stoves and calculation of the total installed capacity achieved by the distributed stoves.

The eligibility criteria of the CPA has been described under section B.5 below

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

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

CPAs included under this PoA will apply a combination of approved small scale methodologies *AMS-I.E* '*Switch from non-renewable biomass for thermal application by the user' version 06.0* and approved baseline and monitoring methodology *AMS-I.I 'Biogas/biomass thermal applications for households/small users' version 04.0*

Tools applicable

Methodology AMS-I.E version 06.0 makes use of the latest version of the following tool:
  a) *Tool for Project emissions from cultivation of biomass v01.0*

Methodology AMS-I.I version 04.0 does not make use of any tools.

CPAs under this PoA will not utilize a standardized baseline.

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

The CPA meets the applicability of approved methodologies AMS-I.E '*Switch from non-renewable biomass for thermal application by the user' version 06.0* and AMS-I.I *'Biogas/biomass thermal applications for households/small users' version 04.0* as justified in Table 5 and Table 6 below.

The combination of these methodologies is applicable based on the *Standard demonstration of additionality, development of eligibility criteria and application of multiple methodologies for programmes of activities version 03.0 paragraph 30* which states that 'Combinations of technologies/measures and/or methodologies for a PoA are eligible where it is demonstrated that there are no cross effects between the technologies/measures applied.

A cross effect analysis has been carried out in line with the CDM *Guideline for the Consideration of Interactive Effects for the Application of Multiple CDM Methodologies for a Programme of Activities (Version 01.0 - EB 68, Annex 3).* The analysis has proven that there are no cross-effects whatsoever in the combination of the two methodologies as outlined in paragraph 13 of the *Guideline for the Consideration of Interactive Effects for the Application of Multiple CDM Methodologies for a Programme of Activities (Version 01.0 - EB 68, Annex 3).* The analysis is shown in Table 4 below:

Table 4: Cross Effect Analysis

Type of interactive effect	Justification of non-interactive effect by the CPA
a) Type I: interactive effects could occur when there is **an exchange of energy** (thermal, mechanical or electrical) or mass transfer between different measures of the CPA, the transfer occurring from a primary, independent measure to a dependent measure;	a) There is no exchange of energy between (insert stoves type) that displaces kerosene stove and (insert stoves type) cook stove that displaces a wood/charcoal stove.
b) Type II: interactive effects could also occur when several measures rely on the **same information** when estimating emission reductions. For example, several measures refer to historical fuel/electricity/heat consumption. They may also occur when combining methodologies relying solely on default factors for setting the baseline.	b) Emission reduction calculations are a function of consumption of baseline fuel and stove efficiency. The CPA relies on different information for the estimation of baseline fuel consumption and baseline stove efficiency. Information about project stove efficiency is the same but this is not relevant in terms of cross effects.

Applicability criteria for AMS-I.I *'Biogas/biomass thermal applications for households/small users'* version 04.0.

Table 5: Applicability of AMS-I.I version 04.0

Methodology Applicability	Justification
This category comprises activities for generation of renewable thermal energy using renewable biomass or biogas for use in residential, commercial, institutional applications (e.g. for supply to households, small farms or for use in built environment of institutions such as schools). Examples of these technologies that displace or avoid fossil fuel use include but are not limited to biogas cook stoves, biomass briquette cook stoves, small scale baking and drying systems, water heating, or space heating systems.	CPA included under this PoA will distribute stoves that generate renewable thermal energy using [insert fuel] which is a renewable biomass.
The total installed/rated thermal energy generation capacity of the project equipment is equal to or less than 45 MW thermal.	The estimated, cumulative rated thermal energy generation capacity installed under the CPA will not exceed 45 MWth,
Each unit (e.g. cook stove, heater) shall have a rated capacity equal to or less than 150 kW thermal. Projects that include units with rated capacity greater than 150 kW thermal may explore AMS-I.C Thermal energy production with or without electricity	The stoves distributed under the CPA have a maximum rated capacity of [insert] kWth, which is less than 150kW
For the specific case of biomass residues processed as a fuel (e.g. briquettes, wood chips), it shall be demonstrated that: a) It is produced using solely renewable biomass (more than one type of biomass may be used). Energy use for renewable biomass processing (e.g. shredding and compacting in the case of briquetting) may be considered as equivalent to the upstream emissions associated with the processing of the displaced fossil fuel and hence disregarded; b) The General guidance on leakage in biomass project activities (attachment C to appendix B of 4/CMP.1 Annex II) shall be followed; c) The project participant can monitor the mass, moisture content and NCV of the resulting biomass fuel, through sampling that meets the confidence/precision level of 90/10; d) Where the project participant is not the producer of the renewable fuel, the project participant and the producer are bound by a contract that shall enable the project participant to monitor the source of	Where biomass residues processed as a fuel is used: a) Stoves included under this PoA on the individual CPAs will use only (insert fuel type) from renewable sources, the (insert fuel type) used is considered renewable based on the definition of renewable biomass -in EB 23 Annex 18. b) The CPA will meet the set criteria in accordance with the general guidance on leakage in biomass project activities. c) The project participant will monitor the NCV of the (insert fuel type) used by the stoves through sampling that meets 90/10 confidence precision level. d) The project participant will get into a contract with the producer of ethanol allowing him to monitor the source of ethanol and account for any leakages. Where other forms of renewable biomass or sources of renewable energy are used, this applicability criteria shall not apply.

renewable biomass to account for any emissions associated with biomass production (as per 4(b) above). Such a contract shall also ensure that there is no double counting of emission reductions.	
The methodology is applicable to a programme of activities, no additional leakage estimations are necessary other than that indicated under leakage section above.	The CPA is part of the Project Gaia Cook Stove Programme of Activities. The generic CPA will comply with the necessary leakage estimations indicated above.

Applicability criteria for AMS-I.E '*Switch from non-renewable biomass for thermal application by the user*' version 06.0

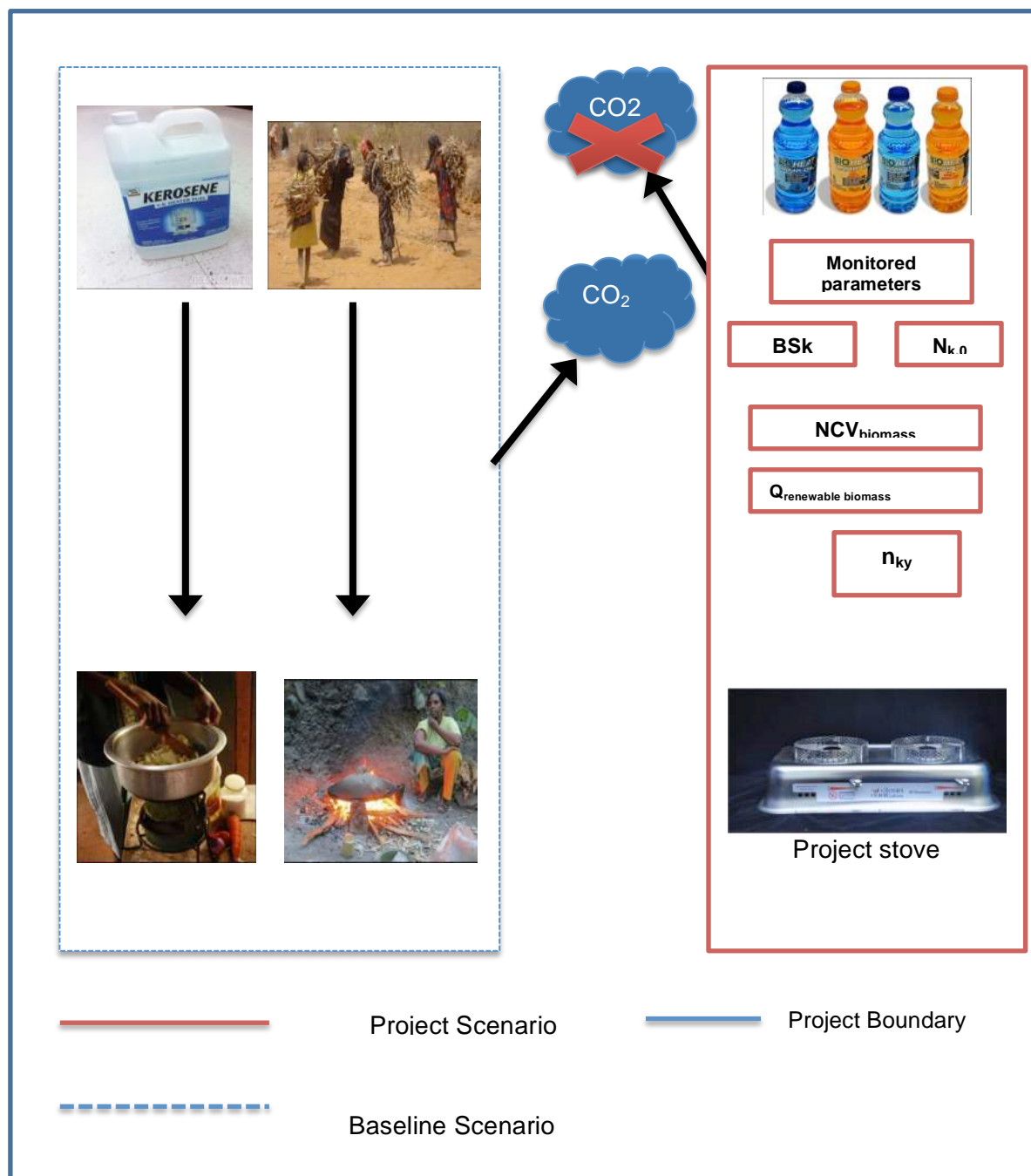**Table 6: Applicability of AMS-I.E version 06.0**

Applicability	Justification
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).	CPA included under this PoA will distribute stoves that will displace the use of non-renewable wood fuel (firewood and charcoal) with stoves that use [insert] as fuel, which is a renewable biomass.
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.	The project participant will evidence in each CPA that non-renewable biomass has been in use since 31 December 1989 using either published literature, official report or statistics.
The methodology is applicable for technologies displacing use of non-renewable biomass by renewable energy	The technologies implemented under this CPA will be energy efficient cook stoves that use [insert] which is a renewable biomass that will displace the use of wood fuel which is a non-renewable biomass used by the baseline stoves..
The use of this methodology in a project activity under a programme of activities (PoA) is legitimate if the following leakages are estimated and accounted for, if required, on a sample basis using a 90/30 precision for the selection of samples, and accounted for: (a) Use of non-renewable woody biomass saved under the project activity to justify the baseline of other CDM project activities can also be a potential source of leakage. If this leakage assessment quantifies a portion of non-renewable woody biomass saved under the project activity that is then used as the baseline of other CDM project activities then y B is adjusted to account for the quantified leakage;	a) The CPA accounts for leakage that arises from non-renewable woody biomass saved under the CPA.

(b) Increase in the use of non-renewable woody biomass outside the project boundary to create non-renewable woody biomass baselines can also be a potential source of leakage. If this leakage assessment quantifies an increase in the use of non-renewable woody biomass outside the project boundary, then y B is adjusted to account for the quantified leakage;	b) Leakage arising from the increased use of non-renewable woody biomass is accounted for in the CPA.
(c) As an alternative to subparagraphs (a) and (b), *By* can be multiplied by a net to gross adjustment factor of 0.95 to account for leakages, in which case surveys are not required.	c) Applicable since the CPA applies the net to gross adjustment factor to account for leakages.
The following further conditions apply for the value of fraction of non-renewable (fNRB) applied in a component project activity (CPA) of a PoA. The choice between (a) conduct own studies to determine the local fNRB value and then apply those values in the CPAs; and (b) use default national values approved by the Board; shall be made ex ante. A switch from national value i.e. choice (b) to sub-national values i.e. choice (a) is permitted, under the condition that the selected approach is consistently applied to all CPAs.	The CPA applies (b) the use default national values approved by the Board.

B.3.   Sources and GHGs

In accordance with the approved small-scale methodology AMS-I.I *'Biogas/biomass thermal applications for households/small users' version 04.0,* the project boundary is the physical, geographical sites of the equipment producing thermal energy during the crediting period. Likewise, according to AMS-I.E '*Switch from non-renewable biomass for thermal application by the user' version 06.0,* the project boundary is the physical, geographical site of the use of biomass or the renewable energy.

Cook Stoves units distributed under this CPA will be located within the national boundaries of Djibouti. The flow diagram below highlights the equipment, systems, emission sources and gases included in the boundary as well as the monitoring parameters in the CPA boundary.

——— Project Scenario	——— Project Boundary
– – – Baseline Scenario	

The greenhouse gases and emission sources included in or excluded from the project boundary are shown in the table below.

	Source	Gas	Included	Justification
Baseline Emissions	**Combustion of non-renewable biomass for cooking**	CO_2	Yes	Main source of emission under AMS-I.E
		CH_4	No	Not considered as a source of emissions as per AMS-I.E
		N_2O	No	Not considered as a source of emissions as per AMS-I.E
	Combustion of fossil fuel for cooking	CO_2	Yes	Main source of emission under AMS-I.I
		CH_4	No	Minor source of emissions as per AMS-I.I
		N_2O	No	Not considered as a source of emissions as per AMS-I.I
Project Emissions	**Combustion of non-renewable biomass for cooking**	CO_2	No	Not relevant for the project as it does not involve cultivation of biomass
		CH_4	No	Not relevant under methodology AMS-I.E
		N_2O	No	Not relevant under methodology AMS-I.E
	Combustion of fossil fuel for cooking	CO_2	No	Not relevant under the option chosen in AMS-I.I
		CH_4	No	Not relevant under methodology AMS-I.I
		N_2O	No	Not relevant under methodology AMS-I.I

B.4. Description of baseline scenario

In accordance with AMS-I.E version 6.0, it is assumed that in the absence of the project activity, the baseline scenario would be the use of non-renewable biomass for meeting similar thermal energy needs. Similarly, AMS-I.I version 4.0 states that the baseline is the fuel consumption of the thermal application used or that would have been used in the absence of the project activity times an emission factor for the fossil fuel displaced.

Therefore, in the baseline scenario of the CPA, CO_2 would have been produced from the combustion of non-renewable biomass and fossil fuels for cooking purposes.

According to world energy outlook in developing countries and especially in rural areas, 2.5 billion people rely on biomass, such as firewood, charcoal, agriculture waste and animal dung, for their cooking needs. In these countries, these resources account for over 90% of the household energy consumption. In absence of better policies this demand is projected to increase from 2.6 billion

reliance in 2015 to 2.7 billion reliance in 2030. This will represent one third of the world population relying on biomass as their source of cooking energy.[32]

The use of biomass itself hasn't been indicated as being the main concern but rather its harvesting which has been cited as being done in an unsustainable manner. The use of inefficient technologies for energy conversion purpose has had adverse effects on the population in which it's employed, these effects range from social effects such as health effects, environmental effects to economical development effects.[33]

About 4.3 million people die yearly prematurely from illnesses attributed to household air pollution caused by the inefficient use of solid fuels[34]. Valuable time and effort is devoted to fuel collection instead of education or income generation.[35]

Two complementary approaches have singled out as a remedy to the situation; promoting more efficient and sustainable use of traditional biomass and encouraging people to switch to modern cooking fuels and technologies.[36]

The quantity of house energy demand in developing countries in 2004 was about 1090 Mtoe with household biomass in developing countries accounting for almost 70% of the world primary energy demand, the use being primarily on household cooking followed by heating space and water heating. [37]

In Sub-Saharan Africa about 76% of the population depends on biomass for cooking.[38] Closer look at regions in Africa below show the high consumption of biomass by Africa countries[39]

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[32] World Energy Outlook 2006

[33] https://www.iea.org/publications/freepublications/publication/cooking.pdf. Accessed on 25 Sep 2015

[34] http://www.who.int/mediacentre/factsheets/fs292/en/ . Accessed on 25 Sep 2015

[35] https://www.iea.org/publications/freepublications/publication/cooking.pdf. Accessed on 25 Sep 2015

[36] World Energy Outlook 2006

[37] https://www.iea.org/publications/freepublications/publication/cooking.pdf

[38] World Energy Outlook 2006

[39] Wood-Based Biomass Energy Development for Sub-Saharan Africa

Percentage of total energy consumption

Biomass (including woodfuel energy consumption (2005)
in thousands of metric tonnes oil equivalent (ktoe)
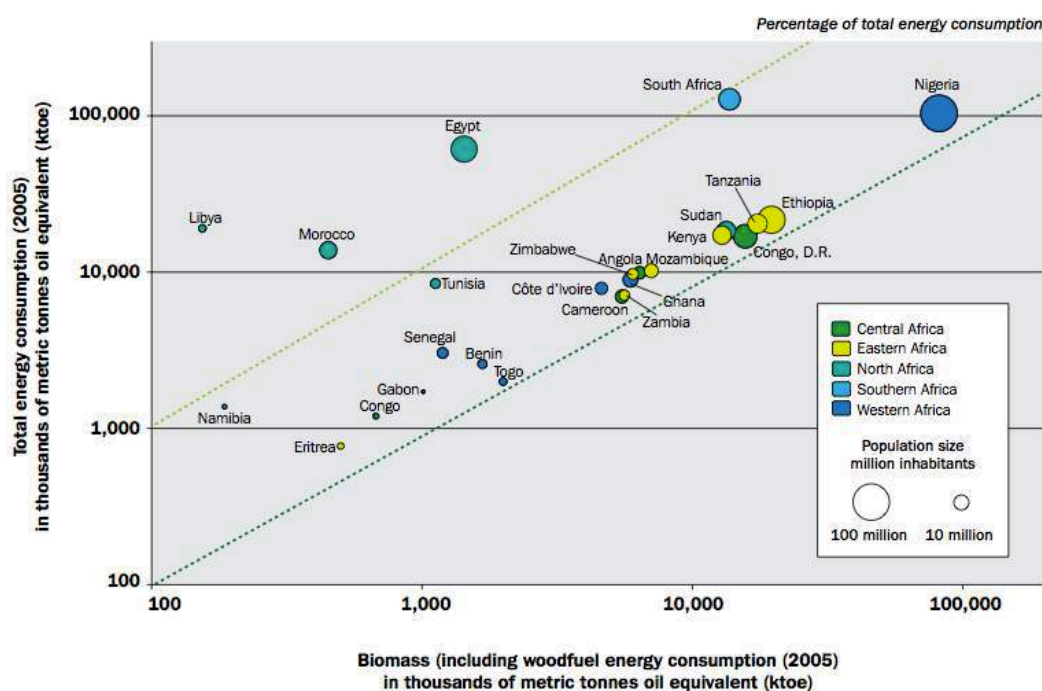
According to the to the results of the General Population and Habitat Census in 2009, the population in Djibouti was estimated to be 818,159 people, of which more than 70% live in urban areas. There are an average of 6.2 people in each household[40]. 80.6% households in Djibouti use kerosene as the source of energy for cooking purposes due to its affordability.[41] According to the UN energy statistics, Djibouti consumes 12,000 tonnes of kerosene annually[42]. A household survey conducted in Somaliland community, which has similar culture and cooking habits as Djibouti reported a daily household consumption of 1.5 liters of kerosene for cooking purposes[43]. However, the high cost of kerosene remains a factor limiting access on the part of poor households, for which firewood constitutes the substitute energy source, primarily in rural areas and in nomad encampments. 12.7% of Djibouti households use fuel wood for cooking, consuming an annual estimate of 50,750 tonnes of fuel wood per household[44].

B.5.   Demonstration of eligibility for a generic CPA

In accordance with para 208 of *the CDM Project Standard version 09.0*, the CME is required to consider any specific guidance in applied methodologies regarding the preparation of separate generic CPA-DDs for each different technology/measure, taking into account differences in the means of demonstration of additionality, emission reduction calculations, and monitoring methods. Based on this guidance, the programme will have two CPA types based on the host country of implementation although additional CPA types might be added in future:

- CPA Type I: Project Gaia Cook Stove Programme Of Activities - CPA000 [Insert identification number] Ethiopia
- CPA Type II: Project Gaia Cook Stove Programme Of Activities - CPA000 [Insert identification number] Djibouti

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[40] Direction de la Statistique et des Études Démographiques (DISED) (Central Statistical Office). 2009. Deuxième Recensement Général de la Population et de l'Habitat de Djibouti. Djibouti City.

[41] Enquête Djiboutienne à Indicateurs Multiple (EDIM). 2007. Resume Analytique et Tableau Recapitulatif des Resultats

[42] United Nations Statistic Division. 2011. Energy Statistics Yearbook. Available at http://unstats.un.org/UNSD/energy/yearbook/2011/285.pdf

[43] Candlelight for Health, Education & Environment(2005). Alternative Energies and Reduction of Dependence on Charcoal in Somaliland

[44] UNDATA (2012): Household fuelwood consumtion-Djibouti

This CPA will fall under CPA Type II. The eligibility to be used for the inclusion of the CPA into the PoA has been developed in accordance to the *CDM project standard (version 09.0)* and *Standard for demonstration of additionality, development of eligibility criteria and application of multiple methodologies for Programme of Activities version 03.0 and following General Guidelines for SSC CDM methodologies version 21 while taking into consideration the applied methodologies* AMS-I.E version 06.0 and AMS-I.I version 04.0

CPA Type II: Project Gaia Cook Stove Programme Of Activities - CPA000 [Insert identification number] Djibouti

No	Requirement in PoA Standard[45]	Eligibility Criteria Description	Documentary Evidence used by CPA to demonstrate compliance (Tick where appropriate)
16 a.	**The geographical boundary of the CPA including any time-induced boundary consistent with the geographical boundary set in the PoA**	All distributed stoves in each CPA are located in the geographic boundary of Djibouti**.**	☐ GPS Coordinates ☐ Area map or Address
16 b	**Conditions that avoid double counting of emission reductions like unique identifications of product and end-user locations (e.g. programme logo)**	Double counting could occur in cases where an individual stove is included in more than one CPA under the same programme or included more than once in the same CPA. Furthermore, double counting can occur if the cook stove is included in a registered single CDM Project Activity or included in a registered PoA	For CPA [**specify title or identification number**], all the following are fulfilled: ☐ Contractual agreements between CME or CPA implementer and end-user on CER transferring. ☐ Agreement between CME and CPA implementer confirming that the CPA has not been registered as single CDM Project Activity or included in a registered CDM PoA. And, individual programme system/unit is identifiable by: ☐Unique serial numbers that uniquely identify individual units to the programme. ☐ End user details (i.e. name, address)
16 c.	**The specifications of technology/measure including the level and type**	The CPA involves the distribution of energy efficient cook stoves	As evidenced by the technical description/manufacturer

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[45] Standard for demonstration of additionality, development of eligibility criteria and application of multiple methodologies for Programme of Activities

		powered by a renewable source.	specifications of the units:
	of service, performance specifications including compliance with testing/certifications;		☐ The stoves distributed under this CPA are powered by {Insert}, a renewable source. ☐ Each unit shall have a rated capacity equal to or less than 150 kW thermal ☐ The total or cumulative installed/rated thermal energy generation capacity of the systems/units is equal to or less than 45 MW thermal. ☐ Confirmation by CPA implementer that each unit (insert stove type) meets the industry standards of quality.
16 d.	**Conditions to check the start date of the CPA through documentary evidence;**	CPA Start date shall not be before the start date of the PoA [46] {i.e. 12 February 2015}	The start of the CPA is {DD/MM/YY}, the date when real action occurred: ☐ It is the date for which the first stove was distributed order for the first project unit was placed. ☐ It is the date for which the first project unit was distributed to the end user.
16 e.	**Conditions that ensure compliance with applicability and other requirements of single or multiple methodologies applied by CPAs**	The CPA has confirmed its compliance among other requirements, with the applicability of AMS-I.E version 6.0 and AMS-I.I version 4.0 in section D.2 of the CDM-SSC-CPA-DD-FORM. A cross effect analysis of the applicability of the methodological combination has been carried out in section D2 of specific CPA-DD	☐ Compliance with applicability of AMS-I.E met in section D2 of specific CPA-DD ☐ Compliance with applicability of AMS-I.I met in section D2 of specific CPA-DD ☐ A cross effect analysis has been carried out in section D2 of specific CPA-DD

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[46] Stat date of PoA is defined as the date when notification on Prior Consideration was sent to the UNFCCC Secretariat.

16 f.	The conditions that ensure that CPAs meet the requirements pertaining to the demonstration of additionality as specified in Section A above;	In line with paragraph 11 of the Methodological tool: *Demonstration of additionality of small-scale project activities Version 10.0,* documentation of barrier 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). Distribution of cook stoves to households/ communities/SMEs form part of the positive list in accordance with para. 11(c) which states that: *"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 documented in section A.5 of the specific CPA-DD, the CPA is implemented in: ☐ Households ☐ Communities ☐ SMEs As evidenced by the technical specification of the cook stoves, and the cumulative number of units distributed under the CPA as explained on the threshold calculation in the emission reduction spread sheet, the cook stove units: ☐ Have a cumulative capacity not exceeding 45 MWth ☐ Have a capacity of less than 5% of the small scale thresh hold.
16 g.	The PoA-specific requirements stipulated by the CME including any conditions related to undertaking local stakeholder consultations and environmental impact analysis;	The PoA shall undergo Local Stakeholder Consultations and Environmental Impact Assessment where required:	As evidenced by the CDM PoA-DD, CDM CPA-DD and the LSC report, a Local Stakeholder Consultation is undertaken at: ☐ PoA level ☐ CPA level As evidenced by host country regulations, the Host Country requires the EIA? ☐ Yes ☐ No If Yes, has the CPA carried out an EIA? ☐ Yes ☐ No
16 h.	Conditions to provide an	If the CPA has not received	The CPA shall prove

	affirmation that funding from Annex I parties, if any, does not result in a diversion of official development assistance;	any public funding from an Annex I country, it shall confirm so by providing a written confirmation letter. If a CPA has received any public funding from an Annex I country, it shall seek a confirmation letter from the Annex I country or any related agencies that the funding will not lead to a diversion of Official Development Assistance.	compliance through one of the two conditions: Through a signed confirmation letter, the CPA has proven that it has not received any public funding from an Annex I country. ☐ Yes ☐ No The CPA has received public funding from an Annex I country. Through a letter from the Annex I country, or any related agencies, the CPA has confirmed that the funding will not result in diversion of Official Development Assistance. ☐ Yes ☐ No
16 i.	**Where applicable, target group (e.g. domestic/commercial/industrial, rural/urban, grid-connected/off-grid) and distribution mechanisms (e.g. direct installation);**	In section A.7 of the CPA-DD, the CPA has already demonstrated that the CPA is implemented within the geographical boundaries of Djibouti. The CPA will further demonstrate the target group in section A.5. of the CPA-DD.	As documented in section A.5 of the CPA-DD, the CPA is implemented in: ☐ Households ☐ Communities ☐ SMEs
16 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" ;**	Sampling will be carried out in line with the *"Standard for sampling and surveys for CDM project activities and programme of activities version 04.1* and latest guidelines for Sampling and surveys for CDM project activities and programmes of activities	As evidenced in section D.7.2 of the CPA-DD, the CPA has established sampling procedures that are in line with the CDM requirements ☐ Yes ☐ No
16 k.	**Where applicable, the conditions that ensure that every CPA in aggregate meets the small- scale or microscale threshold criteria and remains within those thresholds throughout the crediting period of the CPA;**	The cumulative number of units distributed under each CPA will not exceed 45 MWth.	As evidenced by the technical specification of each cook stove and the maximum number of cook stoves that can be distributed in the CPA as provided in emission reduction spread sheet, the cook stove units: ☐ Have a cumulative capacity not exceeding 45 MWth

| 16 l. | Where applicable, the requirements for the debundling check, in case CPAs belong to small-scale (SSC) or microscale project categories. | In accordance with the methodological tool: *Assessment of debundling for small-scale project activities version 04.0*, project activities that consist of independent subsystems that are distributed in multiple locations and are not greater than 1% of the small-scale thresholds defined by SSC methodologies, these project activities are exempted from performing a de-bundling check i.e. considered as being not a de-bundled component of a large scale activity.

The CPA has already demonstrated in eligibility criteria 16i that it comprises of distribution of energy efficient cook stoves powered by a renewable source to multiple locations (households/communities/ SMEs). The CPA will therefore have to meet the following additional eligibility criteria in order to be exempted from performing a de-bundling check. | As evidenced by the technical description/manufacturer specification of the cook stoves, each independent units (cook stove):
☐ Has a rated capacity not exceeding 450 kWth |

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

B.6.1. Explanation of methodological choices

The CPA will utilize a combination of two methodologies to estimate the emission reductions achieved by (insert stove type) stoves distributed under the CPA.

   a) AMS-I.E '*Switch from non-renewable biomass for thermal application by the user' version 06.0* and approved baseline and monitoring methodology
   b) AMS-I.I *'Biogas/biomass thermal applications for households/small users' version 04.0*

The combination of these methodologies is applicable based on the *Standard demonstration of additionality, development of eligibility criteria and application of multiple methodologies for programmes of activities* version 03.0 paragraph 30 which states that 'Combinations of technologies/measures and/or methodologies for a PoA are eligible where it is demonstrated that there are no cross effects between the technologies/measures applied.

A cross effect analysis has been carried out and it has been proven that there are no cross-effects as indicated in section D.2 of the CPA-DD.

Further to the cross effect analysis the combination of the two methodologies is permissible based on paragraph 31.C of the *Standard demonstration of additionality, development of eligibility criteria and application of multiple methodologies for programmes of activities* version 03.0, based on the following argument:

- A principle technology/measure is applied consistently in each CPA using multiple combinations of methodologies. For example, wastewater treatment projects with different ways of utilizing recovered methane (AMS-I.C for heat, AMS-I.D and AMS-I.F for electricity, or both), biomass/biogas projects with different fuel displacement (AMS-I.C and AMS -I.I for fossil fuel, AMS-I.E for non - renewable biomass, or both). The CPAs included under this PoA will apply only one technology/measure that is distribution of efficient cook stoves that utilize renewable biomass to replace either the non-renewable biomass powered cook stoves (firewood and charcoal) or fossil fuel powered cook stoves.

Calculation of emission reductions from the displacement of non-renewable biomass and displacement of fossil fuel

The CPA will utilize the two methodologies to calculate the amount of emission reductions achieved by the project. The methodological application will take into account the baseline fuel being displaced by the project appliance as either non-renewable biomass or fossil fuel.

Calculation of emission reduction from the displacement of non-renewable biomass applying methodology AMS-I.E version 06.0
The methodology assumes that in the absence of the project activity the baseline would be the use of non-renewable biomass for meeting similar thermal needs.

The following steps will be used to calculate emission reduction as per the methodology:

Baseline emissions

Equation 1 of the methodology will be used to estimate the emission reductions

$$ER_y = B_y \times f_{NRB,y} \times NCV_{biomass} \times EF_{projected\_fossil\_fuel} - PE_{BC,y} \qquad \text{Equation (2)}$$

Where:

ER_y	=	Emission reductions during the year y in tCO2e
B_y	=	Quantity of woody biomass that is substituted or displaced in tonnes
$f_{NRB,y}$	=	Fraction of woody biomass used in the absence of the project activity in year y that can be established as non-renewable biomass using survey methods or government data or approved 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)
$EF_{projected\ fossil\ fuel}$	=	Emission factor for the substitution of non-renewable woody biomass by similar consumers. Use a value of 81.6 t CO2/TJ
$PE_{BC,y}$	=	Project emissions due to cultivation of biomass

Determination of By

In accordance with paragraph 12 of AMS-I.E version 06.0, the CPA will determine B_y using one of the following options:

(a) Calculated as the product of the number of appliances multiplied by the estimate of average annual consumption of woody biomass per appliance (tonnes/year); This can be derived from historical data or estimated using survey methods;

B_y will be determined using the following equation:

$$By = Q_{biomass} * N_{k,0} * n_{k,y} * P_{non-renewable}$$

Where:

Parameter	Description
B_y	Quantity of woody biomass that is substituted or displaced per appliance/household in tonnes per year
$Q_{biomass}$	Average annual consumption of woody biomass per appliance/household.
$N_{k,0}$	Number of cook stoves distributed by the CPA in year 1
$P_{non-renewable}$	Proportion of distributed cook stoves that are displacing non-renewable biomass
$n_{k,y}$	Proportion of distributed cook stoves that remain operational in year 1 of operation

Determination of $f_{NRB,y}$

In accordance with AMS-I.E, the CPA is capable of using the following options for the estimation of f_{NRB}

a) Using surveys, government data or values from the CDM website
b) Determined following the following guidelines:

Differentiation between non-renewable and renewable woody biomass

Project participants need to determine the shares of renewable biomass and non-renewable biomass in B_y (the quantity of woody biomass used in the absence of the project activity) using nationally approved methods (e.g. surveys or government data if available) and then determine $f_{NRB,y}$ as described below.

Demonstrably renewable woody biomass (DRB)

Woody biomass is "renewable" if one of the following two conditions is satisfied:

(a) The woody biomass is originating from land areas that are forests where:

(i) The land area remains a forest;

(ii) Sustainable management practices are undertaken on these land areas to ensure, in particular, that the level of carbon stocks[47] on these land areas does not systematically decrease over time (carbon stocks may temporarily decrease due to harvesting); and

(iii) Any national or regional forestry and nature conservation regulations are complied with;

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[47] Carbon stocks may be estimated following the procedures described in the methodological tool "Project emissions from cultivation of biomass".

(b) The biomass is woody biomass and originates from non-forest areas (e.g. croplands, grasslands) where:

(i) The land area remains cropland and/or grasslands or is reverted to forest;

(ii) Sustainable management practices are undertaken on these land areas to ensure in particular that the level of carbon stocks on these land areas does not systematically decrease over time (carbon stocks may temporarily decrease due to harvesting); and

(iii) Any national or regional forestry, agriculture and nature conservation regulations are complied with.

Non-renewable biomass

NRB is the quantity of woody biomass used in the absence of the project activity (B_y) minus the *DRB* component, as long as at least two of the following supporting indicators are shown to exist:

(a) A trend showing an increase in time spent or distance travelled for gathering fuel-wood, by users (or fuel-wood suppliers) or alternatively, a trend showing an increase in the distance the fuel-wood is transported to the project area;

(b) Survey results, national or local statistics, studies, maps or other sources of information, such as remote-sensing data, that show that carbon stocks are depleting in the project area;

(c) Increasing trends in fuel wood prices indicating a scarcity of fuel-wood;

(d) Trends in the types of cooking fuel calculated by users that indicate a scarcity of woody biomass.

Thus, the fraction of woody biomass saved by the project activity in year *y* that can be established as non-renewable, is:

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

Project participants shall also provide evidence that the trends identified are not occurring due to the enforcement of local/national regulations.

The CPA will apply option (a) to determine the fraction of non-renewable biomass $f_{NRB,y}$

Project emissions (PE$_{BC,y}$)

No project emission will be accounted for since the project does not involve cultivation of biomass.

Leakage

Leakage related to the non-renewable woody biomass saved by the project activity shall be assessed based on ex post surveys of users and the areas from which this woody biomass is sourced (using 90/30 precision for a selection of samples). The following potential source of leakage shall be considered:

a) The use/diversion of non-renewable woody biomass saved under the project activity by non-project households/users that previously used renewable energy sources. If this leakage assessment quantifies an increase in the use of non- renewable woody biomass used by the non-project households/users that is attributable to the project activity then B_y is adjusted to account for the quantified leakage. Alternatively, B_y is multiplied by a net to gross adjustment factor of 0.95 to account for leakages, in which case surveys are not required.

The CPA will apply the gross adjustment factor as mentioned above, to account for leakage. Therefore, ex post surveys will not be required.

In accordance with paragraph 20 of the methodology, the general guidance on leakage in biomass project activities shall be followed to quantify leakages pertaining to the use of biomass residues. This document has since been reclassified as the methodological tool: *Leakage in biomass small-scale project activities version 04 (EB 83 Annex 15).* In line with paragraph 23 of the methodological tool, the CPA will evaluate ex ante if there is a surplus of the biomass in the region of the project activity, which is not utilised. If it is demonstrated (e.g., using published literature, official reports, surveys etc.) at the beginning of each crediting period that the quantity of available biomass in the region (e.g., 50 km radius), is at least 25% larger than the quantity of biomass that is utilised including the project activity, then this source of leakage can be neglected otherwise this leakage shall be estimated and deducted from the emission reductions

Thus:

Net Emission Reductions = Emission Reductions per cook stove* Number of appliances– Leakage from biomass residues-$PE_{BC,y}$

Calculation of emission reduction from the displacement of non-renewable biomass applying methodology AMS-I.I version 04.0

Baseline emissions

The methodology describes the baseline as; in the absence of the project the alternative would be the use of fossil fuel for provision of thermal needs to the end-user.

Emissions reductions are calculated following the steps below:

Emission reductions are determined using option (2) of the methodology, based on the thermal energy generated and applying equation 4 as follows

$$ER_y = \sum_k N_{k,0} * n_{k,y} * BS_{k,y} * EF * \eta_{PJ/BL} * NCV_{biomass} - LE_y$$

Where:

ER_y Emission reductions during the year y in t CO2e
$N_{k,0}$ Number of thermal applications k commissioned
$\eta_{k,y}$ Proportion of $N_{k,0}$ that remain operating at year y (fraction)
$BS_{k,y}$ The net quantity of renewable biomass or biogas consumed by the thermal application k in year y (mass or volume units, dry basis)
EF CO2 emission factor (tCO2/GJ)

$$EF = \sum_j x_j * EF_{FF,j}$$

x_j is a fraction representing fuel type j used by the baseline thermal applications displaced by biomass/biogas

$\eta_{PJ/BL}$ Ratio of efficiencies of project equipment and baseline equipment (e.g. cook stove using coal) measured once prior to validation applying the same test procedure (e.g. lab test), as per a national or an international standard. Official data or scientific literature can be used for cross-check purposes

$NCV_{biomass}$ Net calorific value of the biomass (GJ/unit mass or volume, dry basis).

Project emissions

No project emissions are accounted under the selected option for calculating emission reductions.

Leakage emissions

The project equipment will not be transferred out of the project boundary and so no leakage emissions are to be accounted based on paragraph 15 of the methodology, which states that 'If the energy generating equipment introduced by the project activity is transferred from outside the boundary to the project activity, leakage is to be considered.'

In accordance with paragraph 4(b) of the methodology, where biomass residues processed as a fuel is used, the general guidance on leakage in biomass project activities shall be followed to quantify leakages pertaining to the use of biomass residues. This document has since been reclassified as the methodological tool: *Leakage in biomass small-scale project activities version 04 (EB 83 Annex 15).* In line with paragraph 23 of the methodological tool, the CPA will evaluate ex ante if there is a surplus of the biomass in the region of the project activity, which is not utilised. If it is demonstrated (e.g., using published literature, official reports, surveys etc.) at the beginning of each crediting period that the quantity of available biomass in the region (e.g., 50 km radius), is at least 25% larger than the quantity of biomass that is utilised including the project activity, then this source of leakage can be neglected otherwise this leakage shall be estimated and deducted from the emission reductions

B.6.2. Data and parameters fixed ex-ante

Data / Parameter:	$NCV_{biomass}$
Data unit:	TJ/tonne
Description:	Net calorific value of the non-renewable biomass that is substituted
Source of data:	IPCC Default
Value(s) applied:	0.015
Choice of data or Measurement methods and procedures:	The selection of the data is based on the recommendation by the methodology at paragraph 11 that allows the application of IPCC defaults
Purpose of data	Calculation of baseline emissions
Additional comment:	Applicable to AMS-I.E

Data / Parameter:	f_{NRB}
Data unit:	%
Description:	Fraction of non-renewable biomass
Source of data:	The data is sourced from CDM Website and approved by the country's DNA
Value(s) applied:	100%
Choice of data or Measurement methods and procedures:	As recommended by the methodology the project can use establish fNRB using survey methods or government data or approved default country specific fraction of non-renewable woody biomass (fNRB) values available on the CDM website

Purpose of data	Calculation of baseline emissions
Additional comment:	Applicable to AMS-I.E

Data / Parameter:	$Q_{biomass}$
Data unit:	tonnes
Description:	Average annual consumption of woody biomass per appliance
Source of data:	Literature
Value(s) applied:	To be specified in the specific CPA-DD
Choice of data or Measurement methods and procedures:	The methodology provides that the data is source either from historical data or estimated using survey methods. For the purpose of emission reduction this data has been sourced from credible literature
Purpose of data	Calculation of baseline emissions
Additional comment:	Applicable to AMS-I.E

Data / Parameter:	x_j
Data unit:	Fraction
Description:	A fraction representing fuel type j used by the baseline thermal applications displaced by biomass/biogas
Source of data:	Baseline description.
Value(s) applied:	To be specified in the specific CPA-DD
Choice of data or Measurement methods and procedures:	In accordance with the baseline description, kerosene is the only fossil fuel type that will be replaced by the project cook stoves. The stoves solely use (insert fuel type) as fuel and thus will replace the kerosene entirely
Purpose of data	Calculation of baseline emissions
Additional comment:	Applicable to AMS-I.I

Data / Parameter:	$EF_{FF,J}$
Data unit:	tCO_2/GJ
Description:	CO_2 emission factor of fuel type j used by the baseline thermal applications displaced by biomass
Source of data:	IPCC default value
Value(s) applied:	To be specified in the specific CPA-DD
Choice of data or Measurement methods and procedures:	As conservative approach the IPCC emission factor default value for kerosene has will be been selected for calculation of ex-ante emission reductions
Purpose of data	Calculation of baseline emissions
Additional comment:	Applicable to AMS-I.I

Data / Parameter:	η_{PJ}
Data unit:	Dimensionless
Description:	Efficiency of the project stove
Source of data:	Manufactures specification
Value(s) applied:	To be specified in the specific CPA-DD
Choice of data or Measurement methods and procedures:	The ratio has been derived from credible manufactures specification of the stoves

Purpose of data	Calculation of baseline emission
Additional comment:	Applicable to AMS-I.I

Data / Parameter:	η_{BL}
Data unit:	Dimensionless
Description:	Efficiency of baseline stove
Source of data:	Literature data
Value(s) applied:	To be specified in the specific CPA-DD
Choice of data or Measurement methods and procedures:	To be specified in the specific CPA-DD
Purpose of data	Calculation of baseline emission
Additional comment:	Applicable to AMS-I.I

B.6.3. Ex-ante calculations of emission reductions

The ex-ante emission reductions estimates will be based on the combined application of methodologies AMS-I.E '*Switch from non-renewable biomass for thermal application by the user*' *version 06.0* and AMS-I.I *'Biogas/biomass thermal applications for households/small users' version 04.0*

The emissions reduction will be calculated separately following the methodology and aggregated for the CPA-DD as follows:

Emission Reductions from the use of non-renewable biomass – Application of AMS-I.E

Emission reductions from the use of non-renewable biomass is estimated using AMS-I.E version 06.0

Baseline emissions

Equation 1 of the methodology will be used to estimate the baseline emissions

$$ER_y = B_y \times f_{NRB,y} \times NCV_{biomass} \times EF_{projected\_fossil\_fuel} - PE_{BC,y}$$

Where

Parameter	Description	Value	SI Unit	Source
ER_y	Emission reduction per appliance during the year y	Insert	tCO2 e	Calculated
B_y	Quantity of woody biomass that is substituted or displaced per household in tonnes per year	Insert	Tonne/year	Calculated
$f_{NRB,y}$	Fraction of non-renewable biomass used in the absence of the project activity in year y that can be established as non-renewable biomass using survey methods or government data or approved default country specific fraction of non-renewable woody biomass (f_{NRB}) values available on the CDM website	Insert	fraction	CDM Website
$NCV_{biomass}$	Net calorific value of the non-renewable biomass that is substituted	0.015	TJ/tonne	IPCC default
$EF_{projected\_fossil\_fuel,y}$	Emission factor for the substitution of non-renewable woody biomass by similar.	81.6	tCO2/TJ	Methodology default

$PE_{BC,y}$	Project emission due to cultivation of biomass	0	tCO2 e	Calculated
Leakage	Net Gross Factor accounting for leakage	0.95	-	Methodological default

Determination of B_y

$$By = Q_{biomass} * N_{k,0} * n_{k,y} * P_{non-renewable}$$
Where

Parameter	Description	Value	SI Unit	Source
B_y	Quantity of woody biomass that is substituted or displaced per appliance/household in tonnes per year	Insert	Tonne/year	Calculated
$Q_{biomass}$	Average annual consumption of woody biomass per appliance/household	Insert	Tonnes/year	Calculated based on Literature data as shown in the emission reduction spread sheet
$N_{k,0}$	Number of cook stoves distributed by the CPA in year 1	Insert	Number	Project developer
$P_{non-renewable}$	Proportion of distributed cook stoves that are displacing non-renewable biomass	Insert	Percentage	Calculated
$n_{k,y}$	Proportion of distributed cook stoves that remain operational in year 1 of operation	Insert	Percentage	Assumed based on the manufactures specification on the cook stove lifetime

Project emissions ($PE_{BC,y}$)

No project emissions will be accounted for, as the project does not involve the cultivation of biomass

Thus:

$PE_{BC,y}$=0

Leakage

Leakage shall be accounted for by multiplying B_y with a net gross factor of 0.95 for the use/diversion of non-renewable woody biomass saved under the project activity by non-project household/users that previously used renewable energy sources. .

The methodological tool: *Leakage in biomass small-scale project activities version 04 (EB 83 Annex 15* shall be followed (where applicable) to quantify leakages pertaining to the use of biomass residues.

The calculation is as shown in the equation below:

Net Emission Reductions = Emission Reductions per cook stove* Number of appliances– Leakage from biomass residues- 0

Emission reduction from the use of fossil fuel - Application of AMS-I.I

Emission reductions from the displacement of fossil fuels are calculated based **on AMS-I.I *version 04.0.*** The calculation is based on the thermal energy generated using the measured quantity of biomass using equation 4 of the methodology as follows:

$$ER_y = \sum_k N_{k,0} * n_{k,y} * BS_{k,y} * EF * \eta_{PJ/BL} * NCV_{biomass} - LE_y$$

Where:

Parameter	Description	Value	SI Unit	Source
$N_{k,0}$	Number of thermal applications *k* commissioned	Insert	Number	Insert
$\eta_{k,y}$	Proportion of Nk,0 that remain operating at year y (fraction)	Insert	Fraction	Insert
$BS_{k,y}$	The net quantity of renewable biomass or biogas consumed by the thermal application k in year y (mass or volume units, dry basis)	Insert	Mass or volume units, dry basis)	Calculated/Literature
EF	CO2 emission factor (tCO2/GJ) $$EF = \sum_j x_j * EF_{FF,j}$$ Where: x j is a fraction representing fuel type j used by the baseline thermal applications displaced by biomass/biogas	Insert	tCO2/GJ	Calculated
$\eta_{PJ/BL}$	Ratio of efficiencies of project equipment and baseline equipment (e.g. cook stove using coal) measured once prior to validation applying the same test procedure (e.g. lab test), as per a national or an international standard. Official data or scientific literature can be used for cross-check purposes	Insert	Fraction	Calculated
$NCV_{biomass}$	Net calorific value of the biomass (GJ/unit mass or volume, dry basis)	Insert	GJ/tonne	Insert
P_{FF}	Proportion of Cook stoves displacing kerosene in Ethiopia	insert	Fraction	Calculated/literature

Leakage emissions (LE)

The project equipment will not be transferred out of the project boundary and so no leakage emissions are to be accounted based on paragraph 15 of the methodology, which states that 'If the energy generating equipment introduced by the project activity is transferred from outside the boundary to the project activity, leakage is to be considered.

The methodological tool: *Leakage in biomass small-scale project activities version 04 (EB 83 Annex 15 shall* be followed (where applicable) to quantify leakages pertaining to the use of biomass residues where applicable.

Net Emission Reductions= (Emission Reductions per appliance* Number of appliances) – Leakage emissions

Total emission reductions = Emission Reductions from AMS-I.E + Emissions Reductions from AMS-I.I

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:	$Q_{renewable\ biomass}$ and $BS_{k,y}$
Data unit:	Tonnes/yr

Description:	The net quantity of renewable biomass consumed by the thermal application *k* in year *y* (mass or volume units, dry basis)
Source of data:	Historical data for ex-ante estimation and survey results for ex-post estimation
Value(s) applied	To be specified in the CPA DD
Measurement methods and procedures:	This will be measured through surveys carried out during monitoring. Interviews will be carried out on the selected households to be surveyed. The surveys will satisfy 90/10 confidence precision level when done annually and 95/10 when carried out biennially. The CME or third party contracted to carry out the survey will visit the households that contain the selected stoves Through interviewing the end-user of the stove the surveying entity will capture the amount of [Insert fuel type] that the end-user consumes per day or per week. This value shall be reciprocated for the whole year for the sampled end-users and a mean derived out of it to be used for ex-post emission reductions. The interviews will only be carried out on households that the project stove is found to be in operation.
Monitoring frequency:	Annually or Biennial
QA/QC procedures:	The data collected shall be transferred from the surveying entity to the CME in cases where its not the CME carrying out the survey. The data shall be checked for any inconsistency that might lead to biased results and rectified. Depending on the frequency of monitoring the sample results will be required to attain a set precision. Incase the required precision is not attained then the surveying entity will apply the reliability procedures described under the monitoring plan. When biennial inspection is chosen, a 95% confidence interval and 10% margin of error requirement shall be achieved for the sampling parameter on other hand, when the project proponent chooses to inspect annually, a 90% confidence interval and 10% margin of error requirement shall be achieved for the sampling parameter. In the case where the confidence precision level is not reached oversampling will be carried out to achieve this from a buffer sample that will have been calculated during sample drawing otherwise the lower bound of a 90 per cent or 95 per cent confidence interval of the parameter value may be chosen as alternative to repeating the survey efforts.
Purpose of data	Calculation of baseline emissions
Additional comment:	Applicable for both AMS-I.E and AMS-I.I

Data / Parameter:	**NCV$_{biomass}$**
Data unit:	GJ/ mass or volume unit
Description:	Net calorific value of the biomass type
Source of data:	Laboratories tests carried out by the CME according to relevant international standards
Value(s) applied	To be specified in the specific CPA DD

| Measurement methods and procedures: | The parameter shall be monitored through sampling where a sample size shall be calculated as described in of monitoring plan section. The sample size will satisfy a 90/10 confidence precision level.

The CME or contracted third part will visit the selected households for surveys

A sample of [insert fuel] from households where the project appliance has been found to be in operation shall be collected and a lab analysis carried out.
The lab analysis shall meet international standards.

Based on the results, an average shall be calculated and shall be used for ex-post emission reductions.

Where necessary, the amount of ethanol that will be taken to be tested will be replaced with the same amount of ethanol from the CME to avoid cases of non-response as a result of the end-users getting a loss. |
|---|---|
| Monitoring frequency: | Annually |
| QA/QC procedures: | The tests done on the renewable biomass used by the stoves shall be confirmed to meet of national/international standards.

This shall be confirmed by the CME or the third party entity contracted to perform the tests.

The sample results will meet the required precision level and in case they do not then the reliability test shall be conducted.

The consistency of the measurements shall be checked by comparing the measurement results with measurements from previous years, relevant data sources (e.g. values in the literature, values used in the national GHG inventory) and default values by the IPCC |
| Purpose of data | Calculation of baseline emissions |
| Additional comment: | Applicable for the methodology AMS-I.I |

Data / Parameter:	$N_{k,0}$
Data unit:	Dimensionless
Description:	Number of thermal applications k commissioned
Source of data:	Records of installation date of each system
Value(s) applied	To be specified in the specific CPA-DD
Measurement methods and procedures:	At the time of installation all project activity systems shall be inspected and undergo acceptance testing (commissioning) for proper operation by qualified personnel in compliance with specifications. Proper operation of the cook stoves shall be confirmed and evidenced through a signed delivery note between the end-user and the CPA Implementing Entity.
The records will be archived in a project data base which will capture the following:
• The customer address
• Sales date of the stove
• Phone number if applicable
• Stoves serial number
• The baseline stoves
Monitoring frequency:	Continuous
QA/QC procedures:	All project activity systems shall be inspected and undergo acceptance testing (commissioning) for proper operation in compliance with specifications.
The serial numbers of the stoves captured in the distribution will be counter checked with the serial number of the stoves from the batch to make sure that the serial number is well captured,

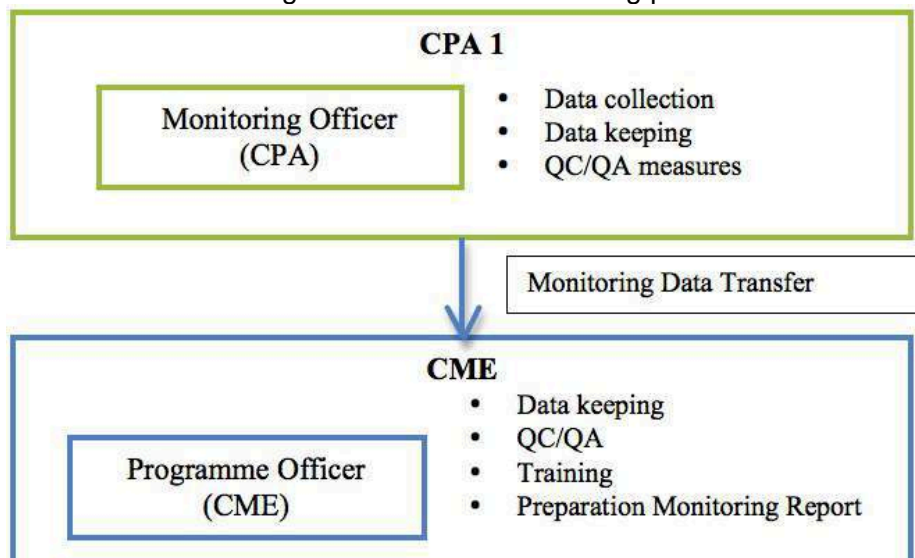| Purpose of data	Calculation of baseline emissions
Additional comment:	Applicable for the methodology AMS-I.I version 04.0 and AMS I.E version 06.0. For the methodology AMS I.E this parameter is used to calculate the parameter By (the quantity of woody biomass that is substituted or displaced in tonnes).

Data / Parameter:	$n_{k,y}$
Data unit:	Fraction
Description:	Proportion of $N_{k,0}$ that remain operating at year y
Source of data:	Stove inspections to determine if they are still operational through sampling annually or biennially
Value(s) applied	To be specified in the specific CPA-DD
Measurement methods and procedures:	The parameter shall be measured by way of sampling where a sample size shall be calculated based on 95/10 or 90/10 confidence precision level

The CME or third party contracted to carry out the survey will visit the households in which the selected stoves are located and through visual inspections of the stoves. The proportion of stoves that are still operating shall be determined by relating the stoves operating to the stoves surveyed

The CME or third party contracted to carry out the survey will capture the type of stove that was used by the end-user prior to acquiring the project stove. This will be used to determine which type of fuel the stove replaced i.e. either fossil fuel of non-renewable biomass. Based on the proportion of stoves replaced the population shall be classified based on the fuel replaced. When sampling is done on annual basis the survey will meet 90/10 confidence precision level and 95/10 confidence precision level shall be chosen, when surveys are done biennially. |
| Monitoring frequency: | At least once every two years (biennial) during the crediting period or annually |
| QA/QC procedures: | The data collected shall be transferred from the surveying entity to the CME in cases where its not the CME carrying out the survey. The data shall be checked for any inconsistency that might lead to biased results and rectified.

Depending on the frequency of monitoring the sample results will be required to attain a set precision. In case the required precision is not attained then the surveying entity will apply the reliability procedures described under the monitoring plan.

When biennial inspection is chosen, a 95% confidence interval and 10% margin of error requirement shall be achieved for the sampling parameter on other hand, when the project proponent chooses to inspect annually, a 90% confidence interval and 10% margin of error requirement shall be achieved for the sampling parameter. In the case where the confidence precision level is not reached oversampling will be carried out to achieve this from a buffer sample that will have been calculated during sample drawing |
| Purpose of data | Calculation of baseline emissions |
| Additional comment: | Applicable for the methodology AMS-I.I version 04.0 and AMS I.E version 06.0. For the methodology AMS I.E this parameter is used to calculate the parameter By (the quantity of woody biomass that is substituted or displaced in tonnes). |

B.7.2. Description of the monitoring plan for a generic CPA
Operational and management structure

The overall responsibility for monitoring of the Project Gaia Cook Stove Programme of Activities will rest with Project Gaia Inc. as the CME.The CME will ensure that each CPA is implemented and monitored as described in the PoA-DD and CPA-DD. In order to achieve this, the CME will enter into a contractual agreement with each CPA implementing entity prior to the CPA inclusion into the PoA. The contract will outline the roles and responsibilities of the CME and CPA Implementing Entity in order to ensure a smooth implementation and monitoring of the CPA. Third Party entities will also be outsourced to facilitate the monitoring of the CPA if need be and they will also get into a contract with the CME

An overview of the organization of the monitoring process is as follows:

Responsibilities of the CME

Once a DOE has approved the inclusion of a CPA and the project activity has begun operations, the CME will take charge of the following:
- Receiving and compiling monitoring records from the CPA implementing entity
- Archiving and keeping monitored data for two years after the end of the crediting period or the last issuance of CERs, whichever occurs later.
- Coordinating monitoring activities and data management during the lifetime of the PoA.
- Contracting a DOE for validation and verification purposes.
- Preparing and submitting monitoring reports and facilitating the verification of the same.
- Acting as the focal point with the CDM Executive Board for matters related to the PoA.
- During the lifetime of the PoA, maintaining all monitoring reports of all CPAs.
- Provide training as required to the CPA implementer's staff that will work on the monitoring of parameters relevant to the emission reduction assessment of the CPA.

The CME will further be responsible for ensuring that the CPA Implementer understands the requirements of the monitoring plan. The CME Programme Manager/Officer in charge will maintain regular communication with the CPA Implementer's staff.

CPA monitoring training

Before the implementation of the CPA or the start of the CPA crediting period, the CME will provide training and guidance regarding the implementation of the CPA monitoring plan to the CPA Implementer's staff. The training will include the following components:
- CDM Project Cycle and the significance of monitoring
- Management structure and work scope
- Components of the monitoring plan
- QA/QC procedures

- Monitoring report template
- Preparation for verification
- Questions and answers

The CME will ensure that the training materials provided to the CPA Implementer for monitoring will be regularly updated in line with changes to the CDM or PoA requirements. The relevant Programme Manager/Officer will responsible for updating the training materials.

The CME will maintain an electronic database that will incorporate the monitored parameters and values required in emission reduction calculations for each CPA, as well as other relevant information. The database will ensure that monitored data is kept and archived for two years after the end of the crediting period or the last issuance of CERs, whichever occurs later.

Responsibilities of the CPA implementer

CPA Implementers will be responsible for the implementation of individual CPAs under the PoA and will also be in charge of:
- Operations and maintenance of the CPA for the duration of the project.
- Record keeping of parameters as per the monitoring plan and provide hard and electronic records to the CME on a regular basis.
- Make available staff for any training conducted by the CME on monitoring approaches and systems.
- Make staff available for validation and verification where applicable.
- Provide the DOE with required documents and access to sites as needed.

More specifically, the CPA implementer will be responsible for the technical aspects related to monitoring activities such as:
- Employment and training of personnel responsible for gathering and recording monitoring data
- Continuous record keeping of the number of cook stoves and the dates when they were distributed to end-users.
- Ensure that the stoves are in good working condition before the transfer of ownership is made to the end-users.
- Ensure that the end-users are well trained on the proper operation of the cook stoves before the transfer of ownership is made. This might be in the form of user manuals, one-on-one training sessions or any other appropriate methods.
- Ensure that the end users are well aware of the emergency procedures and the contact persons in case of such emergencies. This might be in the form of user manuals, warranty cards or any other appropriate methods.
- Continuous record keeping of the number and date when cook stoves have been replaced or serviced.
- If the CPA implementing entity will also distribute fuel to be used to the end-users, ensure continuous recording of the amounts of fuel distributed.
- Incase the CPA implementing entity does not distribute fuel to end-users, the CPA in liaison with the CME will estimate the amounts of fuel distributed to end-users through an appropriate sampling method as further described in the sampling plan.
- Contracting a survey company where needed
- Electronic archiving of all monitored data and parameters.
- Submission of monitoring data to the CME on a regular basis.

As such, the CPA will appoint a monitoring officer who will be in charge of the CPA's monitoring responsibilities as described above. The records will be crosschecked for consistency by another employee of the CPA who is not directly in charge of data recording and finally approved by the director of the CPA. The CPA will thereafter submit on a regular basis, the monitored records to the CME accompanied by the respective copy of records/invoices for sold units as evidence.

Data and parameters to be monitored

The following data and parameters will be monitored as required by the two methodologies AMS-I.E and AMS-I.I:

Parameter	Description	Monitoring / recording frequency
$Q_{\text{renewable biomass}}$	The net quantity of renewable biomass consumed by the thermal application k in year y	At least once every two years (biennial) during the crediting period)
$N_{k,0}$	Number of thermal applications k commissioned	At the time of installation all project activity systems shall be inspected and undergo acceptance testing (commissioning) for proper operation in compliance with specifications. The installation date of each system shall be recorded as soon as it is sold.
$n_{k,y}$	Proportion of $N_{k,0}$ that remain operating at year y (fraction)	At least once every two years (biennial) during the crediting period
$BS_{k,y}$	The net quantity of renewable biomass or biogas consumed by the thermal application k in year y	At least once every two years (biennial) during the crediting period
NCV_{biomass}	Net calorific value of biomass type (insert fuel)	Annually

Sampling Plan

In accordance to the applied methodologies, AMS.I.E ver 6.0 and AMS-I.I ver 4.0, a statistically valid sample of the locations where the systems are deployed, with consideration, in the sampling design, of occupancy and demographics differences can be used to determine parameter values used to determine emission reductions, as per the relevant requirements for sampling in the "Standard for sampling and surveys for CDM project activities and programme of activities". When biennial inspection is chosen a 95 per cent confidence interval and a 10 per cent margin of error requirement shall be achieved for the sampling parameter. On the other hand when the project proponent chooses to inspect annually or the methodology dictates so, a 90 per cent confidence interval and a 10 per cent 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 per cent or 95 per cent confidence interval of the parameter value may be chosen as an alternative to repeating the survey efforts to achieve the 90/10 or 95/10 precision or rather discounting the emission reductions by not less than 3 times the percentage of missed precision during the first two years of the crediting period of the CPA as outlined and recommended by the *"Standard for Sampling and surveys for CDM project activities and programme of activities" ver 04.1 paragraph 16*

Methodology AMS-I.E ver 6.0 specifically requires that:

- Monitoring shall consist of checking of all appliances or a representative sample thereof, at least once every two years (biennial) to ensure that they are still operating or are replaced by an equivalent in service appliance.
- Monitoring should confirm the displacement or substitution of the non-renewable woody biomass at each location. In the case of appliances switching to renewable biomass the quantity of renewable biomass used shall be monitored. For this, project proponents may apply the "Standard for sampling and surveys for CDM project activities and programme of activities".

Parameters to be sampled under methodology AMS-I.E are provided in the table below:

Parameter	Description
$n_{k,y}$	Proportion of distributed units that remain operational at least once in two years.
$Q_{renewable\ biomass}$	The net quantity of renewable biomass consumed by the thermal application k in year y

Likewise, AMS-I.I ver 4.0 specifically requires that:

- At the time of installation all project activity systems shall be inspected and undergo acceptance testing (commissioning) for proper operation in compliance with specifications. The installation date of each system shall be recorded.
- According to the methodology, emission reductions can only be applied to systems that are demonstrated to be operational and in compliance with manufacturer required maintenance procedures, at least once every two years (biennial) during the crediting period. In order to determine this, a statistically valid sample of the residences where the systems are installed, can be used to determine the percentage of systems operating. The only exception to carrying out an actual site visit is where there are on-going rental/lease payments or a recurring maintenance fee by users.

Parameters to be sampled under AMS-I.I are provided in the table below:

Parameter	Description
$n_{k,y}$	Proportion of Nk,0 that remain operating at year y (fraction)
$BS_{k,y}$	The net quantity of renewable biomass consumed by the thermal application k in year y
$NCV_{biomass}$	Net calorific value of biomass type (insert fuel)

In order to ensure that parameter values obtained through sampling are non biased and that data collection minimizes non-sampling (non-random, systematic) errors, the CPA will observe sound practices in designing samples and administering surveys and field measurements as outlined in the "Guidelines for sampling and surveys for CDM project activities and programme of activities" and estimation of sample size will be guided by the type of parameter being sampled that it either proportion parameter or mean parameter.

Sampling design

Sampling design shall be based on the methodologies and the nature of the sampled parameter

Sampling design to be employed for sampling parameters under methodology AMS-I.E

(i) Objectives and Reliability Requirements

The objective of the sampling effort will be to assess the number of distributed units that are still in operation and the amount of renewable biomass used by the appliances. The sample size results will meet either a 90% confidence and a 10% precision level when monitoring is carried out annually and a 95% confidence and 10% precision level when monitoring is done once in two years as described under methodology AMS-I.E.

The parameters to be sampled are as shown below together with the confidence precision level target

Parameter	Descriptions	Confidence/precision
$n_{k,y}$	Proportion of distributed units that remain operational at least once in two years.	Annually 90/10 Biennial 95/10
$Q_{renewable\ biomass}$	The net quantity of renewable biomass consumed by the thermal application k in year y	Annually 90/10 Biennial

		95/10

ii) Target Population

The target population will be households/communities/SMEs in which the cook stoves have been distributed as identified by the CME sales records.

(iii) Sampling method

The PoA will employ simple random sampling method, as the population targeted is homogeneous in nature based on the following

- Technology implemented: The CPA will involve the distribution of cook stoves of the same technology and specification in terms of fuel used and efficiency of the stoves as specified by the manufacturer
- End-users: The end-users to whom the stoves will be distributed will be similar in nature that is they will be will be households
- Boundary covered by the stoves: Stoves distributed will be within the confinement of the CPA boundary as defined in the project boundary.

Sampling will be done on single CPA basis and can be carried out across CPAs as long as homogeneity of the CPAs is established based on the above criteria.

A sample will be selected from population contained in a specific CPA based on calculation procedures indicated in the guidelines of sampling and surveys and through application of a random number generator. The selected stoves location will be visited by the CME or a third party hired to carry out the survey. Each stove will be uniquely identified through its serial number.

The survey of the monitored parameters will involve the following

Parameter	Process of carrying our the survey
$n_{k,y}$	The CME or third party contracted to carry out the survey will visit the households in which the appliances have been distributed and through visual inspections of the stoves the proportion of stoves that are still operating shall be determined by relating the stoves operating to the stoves surveyed. The CME or third party contracted to carry out the survey will capture the type of stove that was used by the end-user prior to acquiring the project stove. This will be used to determine which type of stove and fuel the project stove replaced i.e. either fossil fuel powered stove or fuel wood stove. Based on the proportion of stoves replaced the population shall be classified based on the baseline fuel replaced by the project appliance.
$Q_{renewable\ biomass}$	The CME or third party contracted to carry out the survey will visit the households that have the selected stoves from the sample size calculation. Through interviewing the end-user of the stove the surveying entity will capture the amount of [Insert fuel type] that the end-user consumes per day or per week. This value shall be extrapolated for the whole year for the sampled end-users and a mean derived out of it to be used for ex-post emission reductions. The interviews will only be carried out on households that the project stove is found to be in operation.

In order to make sure that reliability is met, oversampling of 30% will be carried out on the initial calculated sample size to cater for non-response. The oversampling has been chosen based on similar projects. A buffer list will also be created which will include the stoves to be chosen incase the reliability is not met on the first survey exercise. The buffer will be at least 30% of the calculated sample size of the parameter.

The use of buffer in meeting the reliability of the sample will be carried out in stages. Where 10%

will first be drawn as additional stoves to be monitored followed by another 10% then if need be the whole 30%. The CME will draw samples from each CPA

vi)   Sample size calculation

The formula to be used for calculation of the sample size will depend on the type of parameter being sampled i.e. whether the parameter is a proportion/percentage parameter or if the parameter of interest is a mean.

Sample size calculation for $n_{k,y}$

Calculation for nk,y will be calculated following equation (1) paragraph 15 of appendix 2 of the *"Guidelines: sampling and surveys for CDM Project Activities and Programme of Activities version 03.0"*

$$n \geq \frac{1.96^2 N \times p(1-p)}{(N-1) \times 0.1^2 \times p^2 + 1.96^2 p(1-p)}$$

$n_{k,y}$	Proportion of appliances that remain operational

Where:	
n	Sample size
N	Total population
p	Expected proportion of cook stoves that are still in operation
1.96	Represents 95% confidence required.
0.1	Represents 10% precision level on both sides of p

Required data for calculation of the sample size

Parameter	Source
N	Sales records of stoves that have been sold determined per CPA distribution
p	Based on developers own experience or from similar CDM projects

For ex-ante estimation the following data shall be used for calculation of expected sample size for $n_{k,y}$

Data	Value	Source
N	[Insert]	Based on the number of stoves expected to be distributed until the first date of monitoring
p	[Insert]	Based from similar CDM cook stoves projects
n	[Insert]	Calculated
Oversampled size of 30%	[Insert]	Calculated

If the calculation of the sample size returns a value of less that 30 then the surveyor will apply a sample size of 30 as recommended by the "*Standard Sampling and surveys for CDM project activities and programme of activities version 04.1*"

Sample size calculation for Q ~renewable biomass~

Q ~renewable biomass~ being a mean parameter the sample size calculation will be based on equation (4) par 27 of appendix 2 of the *"Guidelines: sampling and surveys for CDM Project Activities and Programme of Activities version 03.0"*

$$n = \frac{1.96^2 NV}{(N-1) \times 0.1^2 + 1.96^2 V}$$

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

Where:

n	Sample size
N	Total number of population
V	Variance
SD	Expected standard deviation
0.1	Precision
1.96	Represents the 95% confidence required when biennial survey is chosen. When annual survey is selected 1.645 will be value used for sample size calculation as shown on sample size calculation spreadsheet.
Mean	Expected mean

Required data for calculation of the sample size

Parameter	Source
N	CME sales records
SD	Based on project proponent experience
Mean	Based on project proponent experience

For ex-ante estimation the following data shall be used for calculation of expected sample size for $Q_{\text{renewable biomass}}$

Data	Value	Source
N	[insert]	Based on the number of stoves expected to be distributed until the date of first monitoring
SD	[Insert]	Conservatively estimated
Mean	[Insert]	Estimated based on project proponent experience
Sample size n	[Insert]	Calculated
Oversampling n	[Insert]	Calculated

If the calculation of the sample size returns a value of less that 30 then the surveyor will apply student t-distribution since the parameter of interest is a mean as recommended by the "*Standard Sampling and surveys for CDM project activities and programme of activities version 04.1*"
The sample size of this parameter shall be calculated based on the type of stove i.e. single burner or double burner

Reliability for sampling results

Depending on the monitoring frequency the sample size will be expected to reach either 90/10 confidence precision level for annual monitoring or 95/10 for the case of biennial monitoring.
In case the sample will not attain the required precision the following options shall be used depending on which is appropriate as recommended by *"Standard Sampling and surveys for CDM project activities and programme of activities version 04.1"*.

- Perform additional data collection that is a supplemental or new sample to reach the required precision level; or
- Apply a correction to the estimates using the options below:

(i) Discounting the emission reduction estimates by either,
   a. Taking the lower or the upper bound, whatever is conservative, of the 90 or 95 per cent confidence interval, depending on the type of methodologies applied; or

   b. Discounting by no less than three times (x3) the percentage precision points missed (e.g. if the attained precision is 90/11 then the emission reduction estimates are discounted by 3 per cent)

Sampling design to be employed for sampling parameters under methodology AMS-I.I

(i) Objectives and Reliability Requirements

The objective of the sampling effort will be to assess the number of distributed units that are still in operation, the amount of renewable biomass used by the appliances and the net calorific value of the renewable biomass used by the stoves. The sample size results will meet either a 90% confidence and a 10% precision level when monitoring is carried out annually or a 95% confidence and 10% precision level when monitoring is done once in two years as described under methodology AMS-I.I.

The parameters to be sampled are as shown below together with the confidence precision level target

Parameter	Descriptions	Confidence/precision
$n_{k,y}$	Proportion of $N_{k,0}$ that remain operating at year y (fraction)	Annually 90/10 Biennial 95/10
$BS_{k,y}$	The net quantity of renewable biomass consumed by the thermal application k in year y	Annually 90/10 Biennial 95/10
$NCV_{biomass}$	Net calorific value of biomass type (insert fuel) and satisfies a 90/10 confidence precision level	Annually 90/10

ii) Target Population

The target population will be households/communities/SMEs in which the cook stoves have been distributed as identified by the CME sales records.

(iii) Sampling method

The PoA will employ simple random sampling method, as the population targeted is homogeneous in nature based on the following

- Technology implemented: The CPA will involve the distribution of cook stoves of the same technology and specification in terms of fuel used and efficiency of the stoves as specified by the manufacturer
- End-users: The end-users to whom the stoves will be distributed will be similar in nature that is they will be will be households
- Boundary covered by the stoves: Stoves distributed will be within the confinement of the CPA boundary as defined in the project boundary.

Sampling will be done on single CPA basis and can be carried out across CPAs as long as homogeneity of the CPAs is established based on the above criteria.

A sample will be selected from population contained in a specific CPA based on calculation procedures indicated in the guidelines of sampling and surveys and through application of a random number generator. The selected stoves location will be visited by the CME or a third party

hired to carry out the survey. Each stove will be uniquely identified through its serial number.

The survey of the monitored parameters will involve the following

Parameter	Process of carrying our the survey
$n_{k,y}$	The CME or third party contracted to carry out the survey will visit the households in which the appliances have been distributed and through visual inspections of the stoves the proportion of stoves that are still operating shall be determined by relating the stoves operating to the stoves surveyed.
	The CME or third party contracted to carry out the survey will capture the type of stove that was used by the end-user prior to acquiring the project stove. This will be used to determine which type of stove and fuel the project stove replaced i.e. either fossil fuel powered stove or fuel wood stove. Based on the proportion of stoves replaced the population shall be classified based on the baseline fuel replaced by the project appliance.
$BS_{k,y}$	The CME or third party contracted to carry out the survey will visit the households that have the selected stoves from the sample size calculation. Through interviewing the end-user of the stove the surveying entity will capture the amount of [Insert fuel type] that the end-user consumes per day or per week. This value shall be extrapolated for the whole year for the sampled end-users and a mean derived out of it to be used for ex-post emission reductions.
	The interviews will only be carried out on households that the project stove is found to be in operation.
$NCV_{biomass}$	The parameter shall be monitored through sampling where a sample size shall be calculated that satisfies a 90/10 confidence precision level. The CME or contracted third part will visit the selected households for surveys
	A sample of the fuel will be taken from households where the project appliance has been found to be in operation and a lab analysis carried out.
	Based on the results, an average shall be calculated and shall be used for ex-post emission reductions.
	Where necessary, the amount of ethanol that will be taken to be tested will be replaced with the same amount of ethanol from the CME to avoid cases of non response as a result of the end-users getting a loss.

In order to make sure that reliability is met, oversampling of 30% will be carried out on the initial calculated sample size to cater for non-response. The oversampling has been chosen based on similar projects. A buffer will also be created which will include the stoves to be chosen incase the reliability is not met on the first survey exercise. The buffer will be at least 30% of the calculated sample size of the parameter.

The use of buffer in meeting the reliability of the sample will be carried out in stages. Where 10% will first be drawn as additional stoves to be monitored followed by another 10% then if need be the whole 30%. The CME will draw samples from each CPA

vii)   Sample size calculation

The formula to be used for calculation of the sample size will depend on the type of parameter being sampled i.e whether the parameter is a proportion/percentage parameter or if the parameter of interest is a mean.

<u>Sample size calculation for $\mathbf{n_{k,y}}$</u>

Calculation for $\mathbf{n_{k,y}}$ will be calculated following equation (1) paragraph 15 of the "*Guidelines: sampling and surveys for CDM Project Activities and Programme of Activities version 03.0*"

$$n \geq \frac{1.96^2 N \times p(1-p)}{(N-1) \times 0.1^2 \times p^2 + 1.96^2 p(1-p)}$$

$n_{k,y}$	Proportion of $N_{k,0}$ that remain operating at year y (fraction)

Where:	
n	Sample size
N	Total population
p	Expected proportion of cook stoves that are still in operation
1.96	Represents 95% confidence required.
0.1	Represents 10% precision level on both sides of p

Required data for calculation of the sample size

Parameter	Source
N	Sales records of stoves that have been sold determined per CPA distribution
p	Based on developers own experience or from similar CDM projects

For ex-ante estimation the following data shall be used for calculation of expected sample size for $n_{k,y}$

Data	Value	Source
N	[Insert]	Based on the number of stoves expected to be distributed until the date of first monitoring
p	[Insert]	Based from similar CDM cook stoves projects
n	[Insert]	Calculated per vintage year (calendar year)
Oversample size of 30%	[Insert}	Calculated

If the calculation of the sample size returns a value of less that 30 then the surveyor will apply a sample size of 30 as recommended by the *"Standard Sampling and surveys for CDM project activities and programme of activities version 04.1"*

Sample size calculation for $BS_{k,y}$

$BS_{k,y}$ being a mean parameter the sample size calculation will be based on equation (4) paragraph 27 of the *'Guidelines: sampling and surveys for CDM Project Activities and Programme of Activities version 03.0.'*

$$n = \frac{1.96^2 NV}{(N-1) \times 0.1^2 + 1.96^2 V}$$

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

Where:

n	Sample size
N	Total number of population
V	Variance
SD	Expected standard deviation
0.1	Precision

1.96	Represents the 95% confidence required when biennial survey is chosen. When annual survey is selected 1.645 will be value used for sample size calculation as shown on sample size calculation spreadsheet.
Mean	Expected mean

Required data for calculation of the sample size

Data	Source
N	CME sales records
SD	Based on project proponent experience
Mean	Based on project proponent experience

For ex-ante estimation the following data shall be used for calculation of expected sample size for $BS_{k,y}$

Data	Value	Source
N	[Insert]	Based on the number of stoves expected to be distributed until the date of first monitoring
SD	[Insert]	Conservatively estimated based on projects proponent own experience
Mean	[Insert]	Estimated based on proponent own experience
Sample size n	[Insert]	Calculated
Oversampling n	[Insert]	Calculated

If the calculation of the sample size returns a value of less that 30 then the surveyor will apply student t-distribution since the parameter of interest is a mean as recommended by the *"Standard Sampling and surveys for CDM project activities and programme of activities version 04.1"*

Sample size calculation for $NCV_{biomass}$

$NCV_{biomass}$ being a mean parameter the sample size calculation will be based on equation (4) paragraph 27 of the guidelines: sampling and surveys for CDM Project Activities and Programme of Activities version 03.0.

$$n = \frac{1.96^2 NV}{(N-1) \times 0.1^2 + 1.96^2 V}$$

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

Where:

n	Sample size
N	Total number of population
V	Variance
SD	Expected standard deviation
0.1	Precision
1.96	Represents the 95% confidence required when biennial survey is chosen. When annual survey is selected 1.645 will be value used for sample size calculation as shown on sample size calculation spreadsheet.
Mean	Expected mean

Required data for calculation of the sample size

Data	Source

N	CME sales records
SD	Based on project proponent experience
Mean	Based on project proponent experience

For ex-ante estimation the following data shall be used for calculation of expected sample size for $NCV_{biomass}$

Data	Value	Source
N	[Insert]	Based on the number of stoves expected to be distributed until the date of first monitoring
SD	[Insert]	Estimated based on international accepted values.
Mean	[Insert]	Conservatively estimated based on international accepted values.
Sample size n	[Insert]	Calculated
Oversampling n	[Insert]	Calculated

If the calculation of the sample size returns a value of less that 30 then the surveyor will apply student t-distribution since the parameter of interest is a mean as recommended by the *"Standard Sampling and surveys for CDM project activities and programme of activities version 04.1"*

Reliability for sampling results

Depending on the monitoring frequency the sample size will be expected to reach either 90/10 confidence precision level for annual monitoring or 95/10 for the case of biennial monitoring.
In case the sample will not attain the required precision the following options shall be used depending on which is appropriate as recommended by *"Standard Sampling and surveys for CDM project activities and programme of activities version 04.1"*

- Perform additional data collection that is a supplemental or new sample to reach the required precision level; or
- Apply a correction to the estimates using one of the options below:

    (i) Discounting the emission reduction estimates by either,
    a. Taking the lower or the upper bound, whatever is conservative, of the 90 or 95 per cent confidence interval, depending on the type of methodologies applied; or

    b. Discounting by no less than three times (x3) the percentage precision points missed (e.g. if the attained precision is 90/11 then the emission reduction estimates are discounted by 3 per cent)

Sampling frame

The PoA will be composed of different sampling frames based on the characteristics of the CPAs and the host country of CPA implementation.
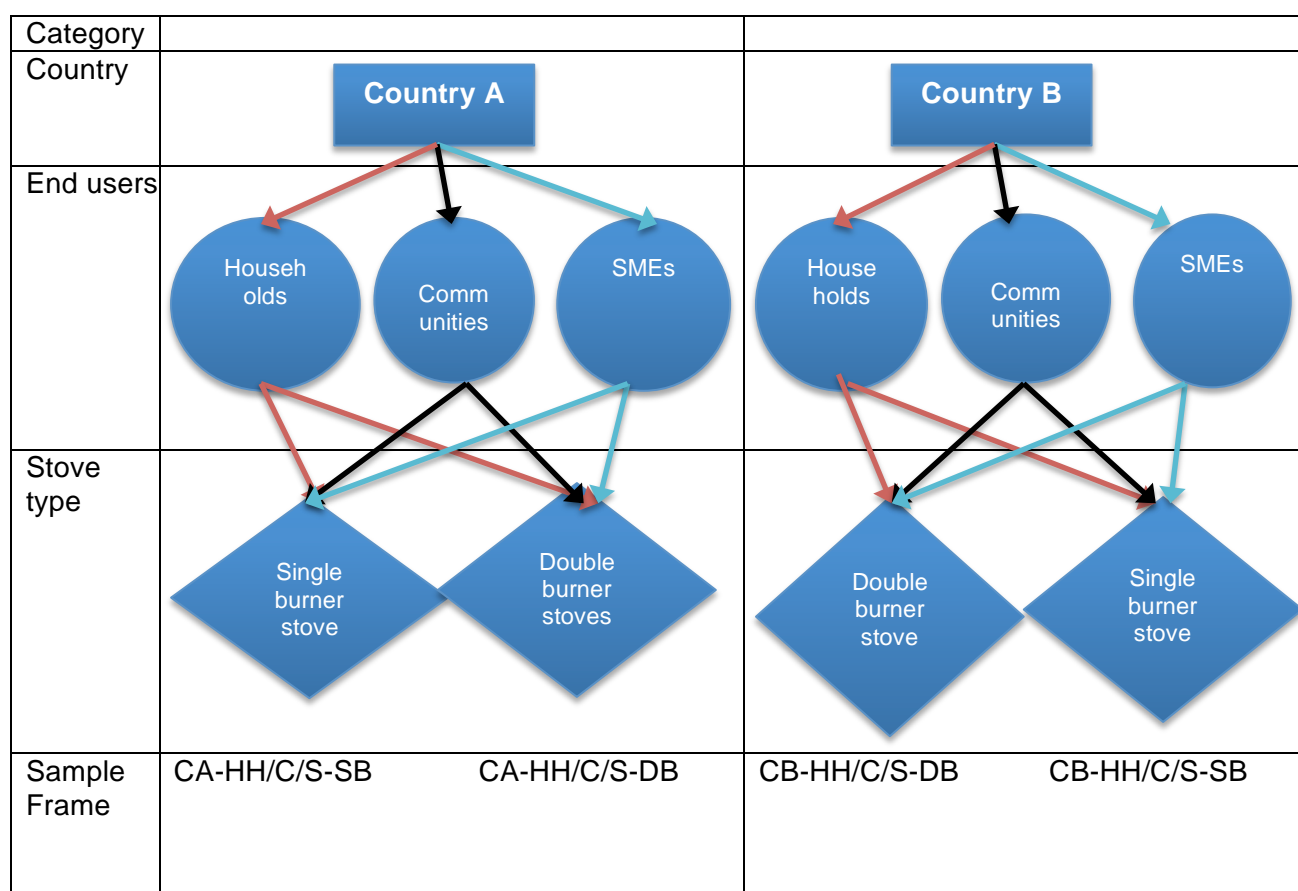
At minimal the CME will classify the sampling frame based on the below characteristics:

Country: Since the PoA is envisaged to include CPAs from different countries the sampling frame will start to be identified at the country level in that CPAs will be differentiated by country

End User: Among the eligibility criteria of the PoA is the end-users who in this case can be residential, SMEs or institutions. This will form the next differentiation of the sampling frame.

Stove type: The stoves can sufficiently be classified as homogenous due to having similar characteristic that is use of similar fuel, having the same efficiency and with the only difference of double burner and single burner stoves, which does not necessarily affect the end-user usage characteristics.

A naming system will be developed to identify the different sampling frame based on the above.

Identification of a sampling frame:

Category		
Country	Country A	Country B
End users	Households Communities SMEs	Households Communities SMEs
Stove type	Single burner stove Double burner stoves	Double burner stove Single burner stove
Sample Frame	CA-HH/C/S-SB CA-HH/C/S-DB	CB-HH/C/S-DB CB-HH/C/S-SB

The sampling frames are not fixed and may be altered from time to time with the CME in order to fit the characteristics of the CPA at hand.

Quality control /Quality assurance

In order to tackle the issue of data quality and analysis together with non-response of the end-users the CME will put in place a quality control mechanism in order to ensure that the monitoring is undertaken in a professional and conservative manner

1) **End- user awareness** at the time of sale, the end user will be made aware that they are required to participate in monitoring activities. This will be via a written statement (in English and local language where appropriate) on the carbon waiver form, or via alternative means such as training sales personnel explaining the importance of monitoring to each customer.

2) **Questionnaire design**. The design of the questionnaire will ensure that the questions are non-intrusive and easy to understand for both the interviewee and interviewer.

3) **Drawing on local knowledge.** Local third parties to be hired in each country will play an important role in tailoring the monitoring approach to suit local circumstances. For example, in some instances, it may be essential for a local person to conduct the interview in order to obtain accurate results. If the end-user needs to explain on the amount of (insert fuel) that he/she uses, the data that they provide should be as accurate as possible. For this to happen however, the question should be well understood by the end-user and the importance of the monitoring exercise too. At most times this will be well put across by a person who understands the use of local dialect.

4) **Quality of contractors**. Any third parties hired by the CME to carry out sampling of data will be required to demonstrate a high level of cultural awareness, local language skills and appropriate experience with data entry and data management. The CME will ensure that contractors are adequately trained for the tasks they are contracted. Training will also be provided on how to deal with non-responses, refusals and other problems should these occur.

If the sampling results are insufficient to achieve the target reliability levels, the CME has a number of options to address this e.g. selecting a larger than necessary sample size before commencing monitoring and having a buffer in which he can rely on in doing extra surveys

The data contained in each individual CPA Monitoring Record and collected during field measurements will be transferred to the CME by the Monitoring Agents. Either the originals of the CPA Monitoring Records or scanned copies of each Record will also be provided to the CME to enable cross-checking. The CME will crosscheck the data provided by contractors against the original Monitoring Records)

5) **Sample size calculation**. The calculation of the sample size will be carried out using estimates for proportions, mean of values and standard deviations as the actual characteristics of the population/sampling frame are unknown ex-ante. In order to ensure the quality of the sampling results, the CME can draw on the provisions for reliability calculations as provided by Guidelines for Sampling and Surveys for CDM Project Activities and Programme of Activities. In the event that the initial sampling results do not fulfill the required level of precision, the CME will Perform additional data collection that is a supplemental or new sample to reach the required precision level; or

- Apply a correction to the estimates using one of the options below:

    (i) Discounting the emission reduction estimates by either,
        a. Taking the lower or the upper bound, whatever is conservative, of the 90 or 95 per cent confidence interval, depending on the type of methodologies applied; or

        b. Discounting by no less than three times (x3) the percentage precision points missed (e.g. if the attained precision is 90/11 then the emission reduction estimates are discounted by 3 per cent)

As a last resort, the sampling exercise may be repeated entirely with an increased sample size.

The data contained in each individual CPA monitoring record and collected during field measurements will be transferred to the CME by the Monitoring Agents. Either the originals of the CPA Monitoring Records or scanned copies of each record will also be provided to the CME to enable cross-checking.

The CME will be responsible for maintaining a secure PoA Distribution and Monitoring Database, which includes all the data relating to the CPAs within the PoA. The Database will be located on the CME's secure server. The system automatically backs up on regular basis any files that have been modified. The files are backed up onto separate hard drives that are regularly swapped to ensure there is always one drive located securely offsite. The CME may improve this system over time with new technology.

6) **Dealing with discrepancies in data**

In cases where the surveyor based on his experiences sees that the data being provided by the end user is not true then the survey will be deemed nullified and more sample from the buffer will be drawn from the buffer selected to cater for that which has been nullified**.**

7) **Dealing with non-cooperation by the end-user**

In cases where the end-users refuses to be interviewed during monitoring, the surveyor will not force him/her to do so but rather will treat the case as non-response and will draw an extra stove from the buffer.

8) Quality check of the data

Through out the lifetime of the project the project developer will have random checks to confirm that the data entered for a specific stove is correct, this will be either through calling or having physical visitation to the end-user household.

The data to be checked will include but not limited to:

- The serial number of the stove visa vie what has been captured on the records.
- The type of stove
- The physical address
- The phone number
- The type of fuel used and the source

If this is found not to be correct the developer will correct this to avoid missing the location of the end-user during monitoring.

Data Analysis

The data obtained from sampling of each group of CPAs will be used to estimate values for the parameters described above. The values will then be factored into the emissions reduction calculations and the monitoring report for each monitoring period, and this will result in the request for issuance of CERs.

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	Project Gaia Inc
Street/P.O. Box	P.O. Box 4190 Gettysburg, PA 17325 USA
Building	-
City	Gettysburg,
State/Region	Pennsylvania
Postcode	
Country	USA
Telephone	(717) 334-5594
Fax	+1 (717) 334-7313
E-mail	hstokesoffice@gmail.com
Website	www.projectgaia.com
Contact person	Harry Stokes
Title	Executive Director
Salutation	Mr
Last name	Stokes
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
Organization	Carbon Africa Limited
Street/P.O. Box	Muthangari Drive
Building	Gath Plaza
City	Nairobi
State/Region	Nairobi
Postcode	14938 -00800 Nairobi
Country	Kenya
Telephone	+254 731 851 754 or +254 706 374 150
Fax	-
E-mail	info@carbonafrica.co.ke
Website	http://www.carbonafrica.co.ke
Contact person	Adriaan Tas
Title	Director
Salutation	Mr
Last name	Tas

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
Middle name	-

Appendix 2. Affirmation regarding public funding

Not Applicable

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

Not Applicable

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

Not Applicable

Appendix 5. Further background information on the monitoring plan

Not Applicable

Appendix 6. Summary of post registration changes

Not Applicable

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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 Appendix 1;
		• Add general instructions on post-registration changes in paragraphs 2 and 3 of general instructions and **Error! Reference source not found.**;
		• 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
Keywords: programme of activities, project design document, SSC project activities