Gold Standard for the Global Goals
Key Project Information & VPA Design Document (PDD)

July 2017, Version 1

Gold Standard

KEY PROJECT INFORMATION

Title of Project:	CDM 7014-0009 Aid Africa Uganda (AAUg01) CPA 1
Title of the PoA:	CDM PoA 7014: Improved Cook Stoves for East Africa (ICSEA)
Brief description of Project:	CDM 7014-0009 Aid Africa Uganda (AAUg01) CPA 1 is one of a number of small-scale Component Project Activities (CPAs) that will be included under the ICSEA PoA GS 973. The project is in line with the stated aims of the Gold Standard. It is also consistent with the applicable UNFCCC rules for the Clean Development Mechanism (CDM). Aid Africa will become one of several Supplier Organisations (Implementers) under the PoA, with CPA GS 6143 being its first project to be included. The stakeholder consultation process, as described in Section E, covers the details of CDM 7014-0009 Aid Africa Uganda (AAUg01) CPA 1. The ICSEA PoA was registered with the UNFCCC (Ref. # 7014) on 17 August 2012, and with the Gold Standard (GS ID 973) on 25 February 2014. The PoA was uploaded to the UNFCCC webpage for the Global Stakeholder Consultation process on 11 November 2010.
Expected Implemetation Date: Expected duration of Project:	10/02/2017 is the date on which the record of the first ICS under the CPA was sold to the end user. 21 years
Project Developer:	Improved Cook Stoves for East Africa (ICSEA) Limited
Project Representative:	Peter Keller
Project Participants and any communities involved:	Aid Africa
Version of PDD: Date of Version:	PoA-DD Version 26, dated 05/12/2019 CPA-DD Version 02, dated 17/01/2018
Host Country / Location:	Uganda
Certification Pathway (Project Certificatin/Impact Statements & Products	Impact Statements & Products
Activity Requirements applied: (mark GS4GG if none relevant)	GS4GG
Methodologies applied:	AMS-II.G. Energy Efficiency Measures in Thermal Applications of Non-Renewable Biomass (version 03) AMS-I.E. Switch from non-renewable biomass for thermal applications by the user (version 06.0)
Product Requirements applied:	CER labelling
Regular/Retroactive:	Regular
SDG Impacts:	3 – Good Health & Wellbeing 5 – Gender Equality 7 – Affordable & Clean Energy 8 – Decent Work & Economic Growth

	13 – Climate Action
Estimated amount of SDG Impact Certified	SDG 13 – Climate Action 85,854 tCO_2e

SECTION A. Description of project

A.1. Purpose and general description of project

>> *(Provide a brief description of the project including the description of scenario existing prior to the implementation of the project.)*

The purpose of this CPA is to produce, market, distribute and sell portable/fixed, domestic/institutional, charcoal/firewood improved cook stoves (ICS) not exceeding the small-scale energy limits of 45 MW_{th} for AMS-I.E. (Type I), and of 180 GWh_{th} for AMS-II.G. (Type II) as set out by the CDM EB.

The ICS may be fuelled with traditional non-renewable biomass or with renewable biomass[1] as a fuel switch to replace the use of non-renewable biomass. In some cases, the Supplier Organisations (SOs) may be renewable biomass fuel suppliers, especially if they are organisations that create substantial amounts of biomass waste (such as from processing coffee, flowers, sugar, rice or similar commodities). In some cases, however, the stove users may use biomass waste they generate on their own. This CPA will cover the distribution of ICS that may use different fuels during a monitoring period. This will be assessed during the stove usage surveys.

The use of renewable biomass in combination with the ICS may happen:

- For the entire operation period of the ICS or only intermittently;
- For a part of any monitoring period, when the fuel switch occurs during the period
- At some, all or none of the ICS distributed by the SO for a specific CPA.

The CME will only allow AMS-I.E. to be used in specific geographical or organisational settings where 100% of the delineated stoves users have switched (or are already using) renewable biomass fuels, based on contractual undertakings given by the SO to the CME. Accordingly, the monitoring of the parameters that are only required for the AMS-I.E. component will be confined to such areas in any one monitoring period. The CME will ensure that a conservative approach is used in such situations, and will ensure that all SO's are aware that the Standard Operating Procedure (SOP), which is part of the PoA's Management Rules, must be complied with.

Aid Africa's improved cook stoves (for both renewable and non-renewable biomass fuel use) will be sold in various sizes and various models. The total number of stoves will be multiplied by the annual average consumption of woody biomass per appliance (tonnes per year) to determine the emission reductions.

These ICS are more efficient in transferring heat to the cooking pots, thus ICS require less fuel to prepare the same meal. This efficiency is translated into fuel savings compared to traditional stoves used in Uganda. By reducing fuel consumption, the CPA reduces greenhouse gas emissions from the use of fuel. In addition, the use of non-renewable biomass may also be replaced by the use of renewable biomass from various sources. This reduction in fuel consumption based on the efficiency increase or the replacement of non-renewable biomass is estimated, and corresponding CO_2 emission reductions are calculated from these savings.

[1] As defined in paragraph 4 of EB23 Annex 18

For stoves that use AMS-II.G. the emission reductions will be based upon an improvement in their thermal efficiency and laboratory test results.

For stoves that use AMS-I.E. the emission reductions will be based upon the calculation of the number of appliances multiplied by the annual average consumption of woody biomass (tonnes/year).

This CPA will be implemented by Aid Africa as the Supplier Organisation (SO) respecting the geographical boundary of Uganda and a maximum energy saving of 180 GWh_{th}/year per CPA. In cases where the number of ICS per CPA exceeds the energy limit, the number of emission reductions (ERs) shall be capped at those generated by ICS saving a maximum of 180 GWh_{th}/year. Any additional ICS shall not be counted.

Due to the use of renewable biomass from various sources as part of the project activity, the total thermal capacity of all ICS distributed and installed shall not exceed the limit of 45 MW_{th} output per CPA.

During the first crediting year, this CPA is expected to generate an estimated 43,675 tonnes of CO_2e reductions from 17,876[2] ICS on average per annum in the first crediting period. These figures are estimates for a section of the CPA that is expected to only apply AMS-II.G. with the Aid Africa 6-Brick Wood Stove model using non-renewable biomass in its first crediting period.

During the first crediting year, this CPA is expected to generate an estimated 42,179 tonnes of CO_2e reductions from 12,305[3] ICS on average per annum in the first crediting period. These figures are estimates for a section of the CPA that is expected to apply a combination of AMS-II.G. and AMS-I.E. with the Aid Africa 6-Brick Wood Stove model using renewable biomass in its first crediting period

With its open access concept, the PoA allows in principle both local manufacturers and importers of stoves to become part of the PoA, and technology/equipment transfer may occur on the CPA level.

Aid Africa is an SO under the 7014 Improved Cook Stoves for East Africa (ICSEA) SSC-PoA, with this being its first CPA.

This CPA will disseminate ICS over the entire territory of Uganda. The primary means to uniquely identify the activities under the CPA is by means of buyer information collected through Sales Agreements. This will at least include stove serial number, customer name, address, date of sale, and where practical and appropriate also GPS coordinates.

[2] 'Calculation of N_y max.' sheet of the Aid Africa CPA CER calculation_ver 01_Aid Africa 6-Brick Wood Stove. These values can change during the course of actual implementation as long as the CPA reaches the threshold defined in the applied methodology under which the stove falls.

[3] 'Calculation of N_y max.' sheet of the Aid Africa CPA CER calculation_ver 01_Aid Africa 6-Brick Wood Stove. These values can change during the course of actual implementation as long as the CPA reaches the threshold defined in the applied methodology under which the stove falls.

The unique identification of the CPA is the code AAUg01: AA for Aid Africa as the Supplier Organisation (SO), Ug for Uganda and 01 is the number of this CPA.

A.2. Eligibility of the project under approved PoA

>> *(Demonstrate how each VPA meets the eligibility criteria as defined in approved PoA)*

This CPA follows the stated goal of the PoA and eligibility criteria for inclusion in the PoA as determined in chapter B.2 of the PoA-DD (part I):

No.	Eligibility criterion - Category	Eligibility criterion - Required condition	Supporting evidence for inclusion	Description of this CPA in relation to the criterion and supporting evidence
1.	Location	The CPA will be involved in the manufacturing, distribution and/or sales of ICS within the geographical region of the PoA	The following document shall be provided: • Contractual agreement between ICSEA Ltd and SO	The CPA will start its distribution with the Aid Africa 6-Brick Wood Stove. Various ICS models may be distributed within the geographical boundary of Uganda after passing the initial rating test using the ICSEA Rating Test Protocol. Uganda is one of the host countries that form the geographical region of the PoA. This is confirmed in the contractual agreement between ICSEA Ltd and SO.
2.	Double-counting	The CPA does not double-count any of its appliances for the ERs estimation	The following document shall be provided: • Contractual agreement between ICSEA Ltd and SO	The CPA does not double-count any of its appliances for the ERs estimation. This is confirmed in the contractual agreement between ICSEA Ltd and SO.
3.	Technology	The ICS disseminated are high efficiency biomass fired cook stoves with a specified efficiency of at least 20%	The following document shall be provided: • Initial rating based on one of the tests for efficiency as determined in AMS-II.G./Version 03 clause 6	This CPA will start its distribution with the Aid Africa 6-Brick Wood Stove, which has a thermal efficiency of 32.3% well over the required 20%. The Center for Research in Energy and Energy Conservation (CREEC) has certified the thermal efficiency of this ICS using

				the ICSEA Water Boiling Test protocol[4].
4.	Start Date	The start date of the CPA shall not be before the commencement of validation of the PoA i.e. the 11 November 2010 on which the PoA-DD was published for global stakeholder consultation.	The following document shall be provided: • Specific Sales Agreements	The start date of this CDM Component Project Activity (CPA) is 10/02/2017, it is the date on which first stove under the CPA was sold to the end user. The starting date of this CPA is after the commencement of validation of the Programme of Activities, i.e. 11/11/2010 the date or which the CDM-POA-DD was published for global stakeholder consultation. The same has been confirmed by the CME through a review of the specific stove sales agreement.
5.	Methodology	The CPA complies with the baselines and monitoring requirements of the applied methodologies i.e., AMS-II.G. (version 3) or AMS-I.E. (version 06.0)	The following document shall be provided: • Completed due diligence questionnaire	The CPA fulfils the applicability and monitoring requirements o both the applied methodologies i.e., AMS-II.G. (version 3) and AMS-I.E. (version 06.0). The same was confirmed by the CME through its review of the completed due diligence questionnaire.
6.	Additionality	Additionality for all CPAs is demonstrated according to "Standard for Demonstration of Additionality, Development of Eligibility Criteria and	• Manufacturers' specifications of ICS • Emission Reduction Calculation Sheet • Copy of Sales Agreements/ Logbooks	The CPA fulfils the additionality requirements as: 1. The CPA will be involvec in the distribution of various ICS models that

[4] The efficiency of the project systems as certified by a laboratory accredited by the CME.

		application of multiple methodologies for Programme of Activities", and "Guidelines for the demonstration of additionality of small scale project activities". CPAs having the following characteristics are thus automatically additional: 1. The improved cook stoves disseminated under each CPA would be isolated units 2. The users of the cook stoves would be households, or communities or SMEs 3. The size of each unit will be no larger than 5% of the small-scale CDM thresholds – therefore, each ICS shall have an installed capacity of less than 2.25 MWth and energy saving of less than or equal to 9 GWhth per year.		have all been certified and have passed the initial rating test according to the ICSEA Rating Test Protocol. These ICS are isolated units as confirmed by the accredited testing laboratories of the ICS. 2. The users of the ICS are households or institutions. The same was confirmed through copy of Sales Agreements/Logbooks. 3. Size of each ICS unit is not larger than 5% of the small-scale CDM threshold – therefore, each ICS has an installed capacity of 0.003657 MWth which is less than the CDM AMS-I.E. threshold of 2.25 MWth and energy saving of 0.0100692 GWhth which is less than the CDM AMS-II.G. threshold of 9 GWhth per year. The same is confirmed through a review of the 'Additionality' sheets of the Aid Africa CPA CER calculation_ver 01_Aid Africa 6-Brick Wood Stove[5]
7.	Local Stakeholder Consultation & Environmental Clearance	The CPA organised a stakeholder consultation and got environmental clearance of the project related activities	The following documents shall be provided: • Stakeholder Report including comments of stakeholders and how the comments were taken into account by the CPA implementer • Environmental clearance letter and/or EIA if requested by national regulations	The CPA involves the distribution of various ICS models that have passed the certification of the initial rating test according to the ICSEA initial rating test protocol. Projects that manufacture stoves may be required to submit a project brief in respect of the sourcing of clay as per the National Environmental

[5] 'Additionality' sheet of the Aid Africa CPA CER calculation_ver 01_Aid Africa 6-Brick Wood Stove.

				Management Authority (NEMA) regulation.[6] Aid Africa has obtained NEMA approval for the extraction of clay. A stakeholder consultation was conducted for this CPA. The same was confirmed with CME through review of SC report.
8.	Public Funding	No public Official Development Assistance funding has been used for the implementation or operation of the CPA, which requires the purchase of CERs from this CPA	The following document shall be provided: • Confirmation Letter of No Diversion of ODA from CPA implementer	The implementation and operation of the CPA does not involve any ODA funding. The same was confirmed by CME through review of confirmation Letter of No Diversion of ODA from the CPA implementer.
9.	Target Group	The target group and distribution mechanism is defined.	Any of the following documents shall be provided: • Sales forecast • Marketing plan • Description of technology (e.g. domestic or institutional stove)	The target group for the sale of ICS under this CPA is households or communities. The same was confirmed through a review of the Sales Agreements/ Logbooks. The stove distribution mechanism was confirmed through a review by the CME of marketing plan and sales forecast.
10.	Sampling Requirements	The SO agrees to support the sampling and survey activities of ICSEA Ltd.	The following document shall be provided: • Contractual agreement between ICSEA Ltd and SO	Fulfilment of this eligibility criterion was confirmed through review of Contractual agreement between ICSEA Ltd and SO.
11.	Small Scale Thresholds	The CPA shall meet the limits for sales or installations for a specific CPA as provided by ICSEA Ltd to ensure that the small scale threshold criteria of 45 MWth for AMS-I.E.	The following document shall be provided: • Contractual agreement between ICSEA Ltd and SO • Sales forecast	The CPA will remain within the small-scale threshold criteria of 45 MWth for AMS-I.E. (Type I) and of 180 GWhth for AMS-II.G. (Type II). The same was verified through a review of ER sheet and sales

[6] NEMA Environmental Impact Assessment Regulations, 1998 only require a project brief for projects listed in the Third Schedule of the National Environment Act, which only applies to SOs that manufacture ICS.

		(Type I) and of 180 GWhth for AMS-II.G. (Type II) are met.		forecast.
12.	De-bundling	The CPA is not a de-bundled component of another CPA or CDM project activity and follows the de-bundling criteria as described in section C of PoA-DD and section A.12 of CPA-DD.	The following evidence shall be provided: • Relevant information as described in section A.8 of CPA-DD and section C of PoA-DD, following the relevant de-bundling guidelines	This eligibility criterion has been met by the CPA and the same was confirmed through review of relevant information as described in section A.8 of CPA-DD.
13.	Inclusion in PoA	The CPA is validated in order to be included in ICSEA.	The following document shall be provided: • Inclusion Report	CPA has met this eligibility criterion and the same was confirmed through a review of inclusion report.
14.	Voluntary Action	The proposed CPA is a voluntary action by the SO	Any of the following documents shall be provided: • Contractual agreement • Published statement, vision or mission of the SO	CPA fulfils this eligibility criterion and the same was confirmed through review of contractual agreement and published statement, vision or mission of SO.
Additional criteria only for a combination of AMS-II.G. and AMS-I.E				
15.	Fraction of Non-Renewable Biomass	Fraction of Non-Renewable Biomass ($f_{NRB,y}$) shall be based on national values or datasets.	The following document shall be provided: • Letter from national forestry authorities and any publically available documents or literature for e.g. FAO reports.	$f_{NRB,y}$ (Fraction of Non-Renewable Biomass) calculation for this CPA is based on national values or datasets. The same was verified through the review of the Uganda National Forestry Authority letter.
16.	Methodology	All stoves under AMS-I.E. shall use renewable biomass as defined in Annex 18, EB 23	The CME has developed a Standard Operating Procedure (SOP) to ensure that future CPAs under the PoA that use renewable biomass will adhere to the cited CDM definition of renewable biomass, and are capable of demonstrating to the CME and the DOE that the biomass used by the CPAs can be considered as renewable.	All the stoves under AMS-I.E. in this CPA will use renewable biomass as defined in Annex 18, EB 23. The same was confirmed by the CME in its Standard Operating Procedure (SOP).

17.	Methodology	CPAs applying combination of AMS-I.E. and AMS-II.G. shall comply with recommendations provided under F-CDM-SSCwg SSC_624	The following document shall be provided: • The PoA Management Rules have been amended to ensure all Supplier Organisations are aware of the recommendations. • Contractual agreement between ICSEA Ltd and SOs confirming that clearly defined groups of stove users are using renewable biomass fuel, to ensure that conservative monitoring and ER calculation takes place. Any shifting of groups of households between the baselines shall require each CPA to furnish full details of how 100% compliance with the new methodology can be assured and that 90/10 or 95/5 monitoring precision can be assured. • The revised monitoring plan will assure compliance with recommendations provided under F-CDM-SSCwg SSC_624. • A signed statement by SOs that specific groups of ICS users will be using only renewable biomass as their regular source of fuel.	This CPA applies combination of AMS-I.E. and AMS-II.G. and complies with the requirements provided under SSC working group recommendations (F-CDM-SSCwg SSC_624). The same was confirmed through review of: 1. PoA Rules 2. Contractual agreement between ICSEA Ltd and SOs. 3. A signed statement by SOs confirming that specific groups of ICS users will be using only renewable biomass as their regular source of fuel.
18.	Methodology	CPAs applying the combination of AMS-I.E. and AMS-II.G. shall comply with the requirements stated in the guidelines for the consideration of interactive effects in EB68, Annex 3.	The ER Calculation will assure compliance with guidelines provided under paragraph 14 of EB68, Annex 3.	This CPA applies combination of AMS-I.E. and AMS-II.G. and complies with the requirements stated in the guidelines for the consideration of interactive effects in EB68, Annex 3. The same was confirmed through review of ER sheet

A.3. Legal ownership of products generated by the project and legal rights to alter use of resources required to service the project

>> (Justify that project owner has full and uncontested legal ownership of the products that are generated under Gold Standard Certification and has legal rights concerning changes in use of resources required to service the Project for e.g water rights, where applicable.)

Aid Africa was required to state in its application to join ICSEA how the creators of the Certified Emission Reductions (CERs), namely the women using the improved cook stoves (ICS) can receive significant benefits from the sale of these CERs in the form of more affordable ICS, a free annual ICS maintenance service and a fair portion of the resulting carbon income – either to themselves or to community projects. This is a unique feature of the ICSEA PoA and demonstrates the commitment of the CME (Improved Cook Stoves for East Africa (ICSEA) Ltd) and the CPA to a fair trade ethos in the way that the households and communities are involved.

The agreement between the CME and Aid Africa clearly defines the ownership of the CERs, which originates with the stove users and then passes to Aid Africa via the Sales Agreement/Logbooks. The CME claims no ownership over the resulting CERS. They remain with Aid Africa, and it is free to market its CERs, in which case the CME passes the CERs onto Aid Africa (or the purchaser) as soon as they are issued. However, Aid Africa may choose to use the PoA's grouped (together with other ICSEA CPAs) CER tender as a way of securing a better price.

To ensure transparency in every CER transaction, and in accordance with the Gold Standard[7], the transfer of the ownership of the CERs will be clearly described to the stove user by Aid Africa distributors. Distributors will use graphic designs that match the legal terms written at the back of the Sales Agreement/Logbook for each distributed stove, for the transfer of rights to ownership. Each year the CPA will submit a statement to the CME describing how the CPA plans to share the revenues earned from the CERs in each year's monitoring period. This annual statement will cover both the transfer of ownership of CERs along the investment chain, from the stove users who create the emissions reductions to Aid Africa, as well as the share of reciprocal benefits provided by Aid Africa to the stove users in return for the CERs.

The end-users of ICS have to be informed about the transfer of their rights to ownership of the CERs, and their willingness to give up their ownership of CERs, and to accept reciprocal benefits in return, and this confirmed and recorded in the Sales Agreement/Logbook. The topic of ownership of CERs and reciprocal benefits was discussed during the Stakeholder Consultation meeting and other trainings in clear language, and it is clearly and visibly stated in communications and training materials and in Sales Agreements/Logbooks. Proof that end-users are aware of and are willing to give up their rights on the emission reductions is provided in the Sales Agreements/Logbooks, and in the records of discussions about the transfer of credit ownership during other local stakeholder consultations.

[7] v2.1 Annex C, (Credit Ownership).

The CME is also encouraging Aid Africa to explain this transfer process to stove buyers through the use of point-of-sale posters using low-literacy graphic illustrations (see below), leaflets and verbal explanations.

Figure 1: Low-literacy Graphic Illustration used together with the Sales Agreement/Logbook to explain the transfer of the ownership rights to the carbon credits from the Stove User to Aid Africa in exchange for benefits.

A.4. Location of project

A.4.1. Host Country

>>

Uganda

A.4.2. Region/State/Province etc.

>>

Starting with Gulu District, Northern Region, this CPA will scale up to cover the entire geographical territory of Uganda.

A.4.3. City/Town/Community etc.

>>

Starting with Gulu Municipality, this CPA will scale up to cover the entire geographical territory of Uganda.

A.4.4. Physical/Geographical location

>> (*Include information allowing the unique identification of this project.)*

Aid Africa, registration number S. 5914/7121 under the Non-Goverrnment Organisation Registration Act, CAP. 113 of the Republic of Uganda, P.O. Box 583, Gulu, Uganda.

It is the Supplier Organisation and implementer of this SSC-CPA. The contact details of the implementer are provided in Annex 1.

This CPA will disseminate ICS over the entire territory of Uganda. The primary means to uniquely identify the activities under the CPA is by means of buyer information collected through Sales Agreements. This will at least include stove serial number, customer name, address, date of sale, and where practical and appropriate also GPS coordinates.

Figure 2: Map of Uganda

GPS Coordinates for the Aid Africa office in Gulu District are:
Latitude: 2°46'28.45"N
Longitude: 32°17'56.36"E

A.5. Technologies and/or measures

>> *(Describe the technologies and measures to be employed and/or implemented by the project, including a list of the facilities, systems and equipment that will be installed and/or modified by the project. Include information essential to understand the purpose of the project and how it will contribute positively to three SDGs.)*

1. Technologies and measures being employed and/or implemented by the CPA

This CPA shall initially distribute the Aid Africa 6-Brick Wood Stove illustrated in Figures 1 & 2 below, but may distribute other models of ICS that meet the minimum thermal efficiency requirement of 20%.

Figure 3: Photo of the Aid Africa 6-Brick Wood Stove

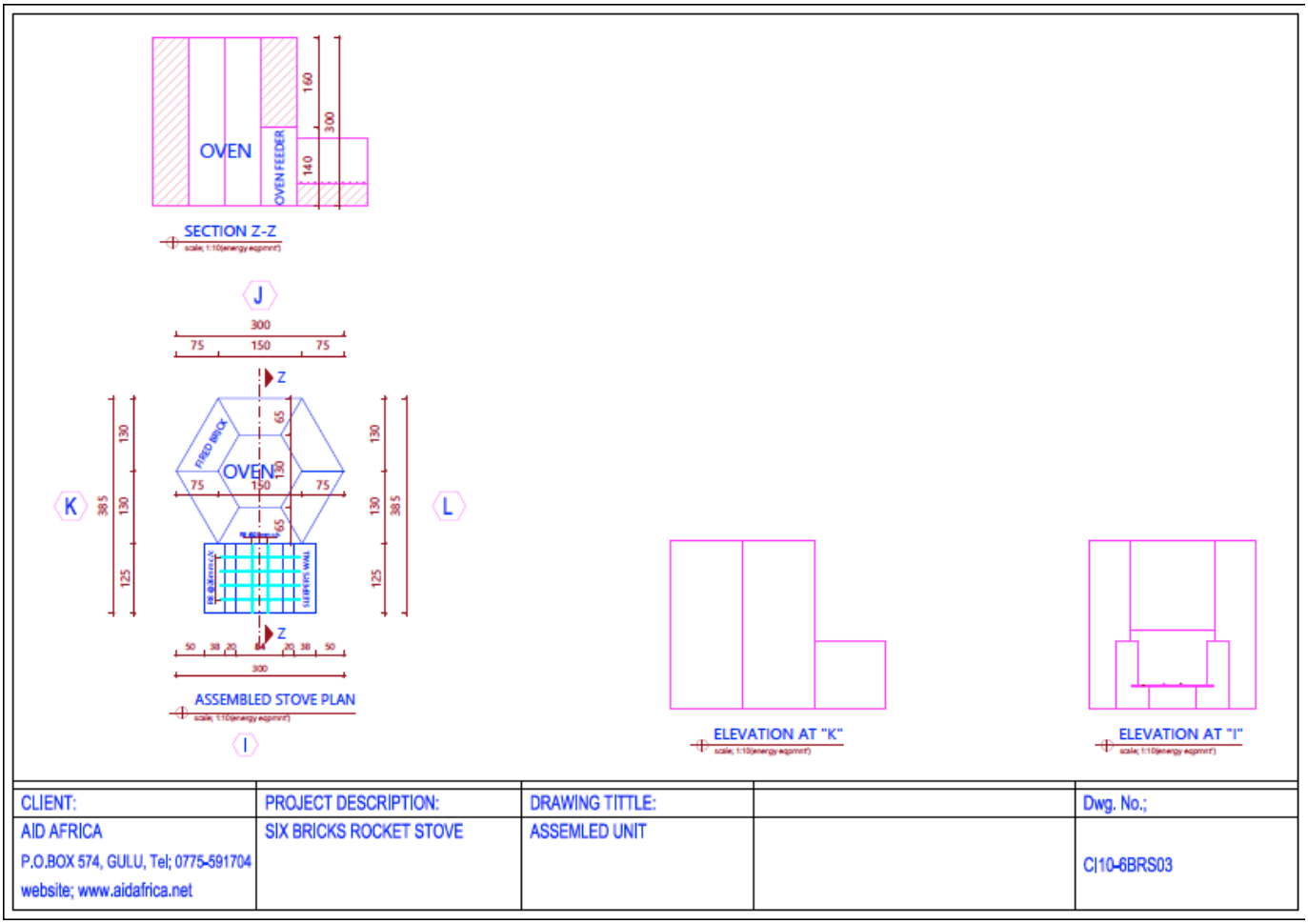


Figure 4: Technical specifications for the Aid Africa 6-Brick Wood Stove

a) This CPA includes the introduction of ICS. The stoves are small appliances for efficiency improvements in the thermal application of non-renewable biomass. In addition, the ICS may be fuelled from renewable biomass sources. Accordingly, the following approved small-scale methodologies are applied in combination:

- AMS-II.G, version 03, "Energy efficiency measures in thermal applications of non-renewable biomass"[8]
- AMS-I.E., version 06, "Switch from non-renewable biomass for thermal applications by the user"[9]

b) The CPA shall meet the limits for sales or installations for a specific CPA as provided by ICSEA Ltd to ensure that the small-scale threshold criteria of 45 MW_{th} for AMS-I.E. (Type I) and of 180 GWh_{th} for AMS-II.G. (Type II) are met.

This CPA may distribute, track and maintain fixed or portable, domestic or institutional stoves burning non-renewable charcoal or firewood, or any renewable biomass fuel. Each stove model will have an initial rating test certificate that passes the Water Boiling Test for a thermal efficiency rating of above 20% as well as a safety test.

[8] http://cdm.unfccc.int/methodologies/DB/UFM2QB70KFMWLVO7LJN8XD1O2RKHEK

[9] http://cdm.unfccc.int/methodologies/DB/O799FU5XYGECUSN22G84U5SBXJVM6S

If and when the CPA, or defined stove user groups, make a switch from non-renewable biomass to renewable biomass, the CME's Standard Operating Procedure (SOP) will be followed by the CPA to ensure that the use of renewable biomass will adhere to the AMS-I.E. requirements as described in Section A.6 of the PoA-DD.

c) In accordance with paragraph 4 of AMS-II.G. (version 03), it is assumed that in the absence of the project activity, the baseline scenario would be the use of fossil fuels for meeting similar thermal energy needs, and this baseline is applied in all SSC-CPAs.

Similarly, in accordance with paragraph 10 of AMS-I.E. (version 06.0), it is assumed that in the absence of the project activity, the baseline scenario would be the use of fossil fuels for meeting similar thermal energy needs, and this baseline is applied in all SSC-CPAs.

However, the baseline scenario for the AMS-I.E. methodology or the approved combination of methodologies will be calculated as per the guidelines for the consideration of interactive effects for the application of multiple CDM methodologies for a Programme of Activities, EB68 Annex 3, paragraph 14(a).

2 As per the "Standard for demonstration of additionality, development of eligibility criteria and application of multiple methodologies for programme of activities" it is required to demonstrate that there are no cross effects between the technologies/measures to be applied. CDM EB at its 68th meeting has approved the application of combination of methodologies AMS-II.G. and AMS-I.E. (refer paragraph 16 of "General guidelines for SSC CDM methodologies" (version 19.0)). Hence, the combination of these methodologies can therefore be applied without further assessment of cross effects.[10]

3 ICS are more efficient than traditional stoves as they reduce heat loss. Domestic and institutional ICS models have been shown to use significantly less wood fuel to cook the same amount of food in comparison to traditional stoves. During the life of the CPA, research and development work may result in more efficient ICS. These shall be included in the CPA, subject to the appropriate baseline studies, standardised baselines and tests proving real and measurable quantities of wood fuel saved.

The ICS are both portable as well as fixed built-in models. The specific designs and models provided under the CPA will be tested and rated by the testing organisations(s) under authorisation from the CME. The tests will ensure that the respective models meet standardised safety and efficiency requirements and that their emissions reductions are rated according to the approved monitoring methodologies. The baseline traditional domestic and institutional stove for firewood in Uganda is the three stone fire, and for charcoal the traditional metal stove, such as the metal sigiri in Uganda. These have a high fuel consumption due to, among other things, their lack of an improved combustion air supply and of a flue gas ventilation system.

[10] http://cdm.unfccc.int/UserManagement/FileStorage/NCLGIQTKVB3856UZP4O1AMDRF90XW7

4 The baseline scenario is a continuation of current practice, thus identical to the scenario existing prior to the implementation of the CPA.

5 With the open access nature of the PoA, the CME promotes knowledge about new stove and fuel technologies to the CPAs and to many agencies of the Party that support both local manufacturers and importers of stoves to become part of the PoA, and technology/equipment transfer may occur on the CPA level.

6 Information essential to understand the purpose of the project and how it will contribute positively to three SDGs is provided in Section B.6.1.

A.6. Scale of the project

>> (Define whether project is micro scale, small scale or others. Justify the scale referring to relevant activity requirement.)

This CPA is a small scale Community Service (CS) project that leads to climate change mitigation and adaptation by providing or improving access to services/resources at household or community or institutional level.

This CPA is a small scale project for Energy Efficiency and Fuel Switch. The size of each ICS unit is not larger than 5% of the small-scale CDM thresholds – therefore, each ICS has an installed capacity of 0.003657 MWth which is less than the CDM AMS-I.E. threshold of 2.25 MWth and energy saving of 0.01000692 GWhth which is less than the CDM AMS-II.G. threshold of 9 GWhth per year.

Its pre-identified CS project type is End-Use Energy Efficiency as defined in the Community Services Activity Requirements section 3.1.1. (b).

A.7. Funding sources of project

>> (Provide the public and private funding sources for the project. Confidential information need not be provided.)

No public funding or ODA has been received for the implementation of the CPA[11]. This CPA will be funded by Aid Africa.

SECTION B. Application of selected approved Gold Standard methodology

B.1. Reference of approved methodology

>>

The CPA is part of CDM Sectoral Scope 3: Energy demand, AMS-II.G version 3 , "Energy Efficiency Measures in Thermal Applications of Non-Renewable Biomass", as well as, Sectoral

[11] Declaration of Non-Use of Official Development Assistance by Project Implementer, dated 24/08/2017, provided to DOE.

Scope 1: Fuel switch, AMS-I.E version 6, "Switch from Non-Renewable Biomass for Thermal Applications by the User".

B.2. Applicability of methodology

>> (Justify the choice of the selected methodology(ies) by demonstrating that the project meets each applicability condition of the applied methodology(ies))

Reference to methodologies and standardized baselines

- AMS-II.G. Energy Efficiency Measures in Thermal Applications of Non-Renewable Biomass (version 03.0)[12].
- AMS-I.E. Switch from non-renewable biomass for thermal applications by the user (version 06.0)[13].
- Methodological Tool: Project and leakage emissions from biomass (version 02.0)[14].
- Methodological Tool: Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion (version 02)[15].
- Methodological Tool: Tool to calculate baseline, project and/or leakage emissions from electricity consumption (version 01)[16].
- General guidance on leakage in biomass project activities (version 03)[17]
- Guidelines for the consideration of interactive effects for the application of multiple CDM methodologies for a Programme of Activities (version 01)[18]

[12] http://cdm.unfccc.int/methodologies/DB/UFM2QB70KFMWLVO7LJN8XD1O2RKHEK
[13] http://cdm.unfccc.int/methodologies/DB/O799FU5XYGECUSN22G84U5SBXJVM6S
[14] http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-16-v1.pdf/history_view
[15] http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-03-v2.pdf/history_view
[16] http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-05-v1.pdf/history_view
[17] https://cdm.unfccc.int/Reference/Guidclarif/ssc/methSSC_guid04.pdf
[18] https://cdm.unfccc.int/Reference/Guidclarif/meth/meth_guid49.pdf

B.3. Project boundary

>> *(Present a flow diagram of the project boundary, physically delineating the project, based on the description provided in section A.5 above.)*

For the purpose of GHG mitigation/sequestration following table shall be completed (delete if not required)

The gas included is carbon dioxide in the CPA-boundary that is the physical, geographical site of the ICS.

Sources and GHGs for AMS-II.G.

Source		GHG	Included?	Justification / Explanation
Baseline	Combustion of charcoal or firewood	CO_2	Yes	Source of baseline emissions
		CH_4	No	Excluded for simplification
		N_2O	No	Excluded for simplification
Project Activity	Combustion of charcoal or firewood	CO_2	Yes	Source of project emissions
		CH_4	No	Excluded for simplification
		N_2O	No	Excluded for simplification

Sources and GHGs for AMS-I.E.

Source		GHG	Included?	Justification / Explanation
Baseline	Combustion of non-renewable firewood or charcoal	CO_2	Yes	Source of baseline emissions
		CH_4	No	Excluded for simplification
		N_2O	No	Excluded for simplification
Project Activity	Combustion of renewable biomass	CO_2	No	No emission source due to the fact that 100% of the firewood or charcoal is displaced by renewable biomass.
		CH_4	No	Excluded for simplification
		N_2O	No	Excluded for simplification
Project Emissions	Project emissions from cultivation of biomass	CO_2	No	N/A
		CH_4	No	N/A
		N_2O	No	N/A
Leakage Emissions	Leakage due to shift of pre-project activity	CO_2	No	N/A
		CH_4	No	N/A
		N_2O	No	N/A
	Leakage due to diversion of biomass residue from other applications	CO_2	No	N/A
		CH_4	No	N/A
		N_2O	No	N/A

B.4. Establishment and description of baseline scenario

>> (Explain how the baseline scenario is established in accordance with guidelines provided in GS4GG Principles & Requirements and the selected methodology(ies). In case suppressed demand baseline is used then same should be explained and justified.)

According to paragraph 4 of AMS-II.G. (version 03), it is assumed that in the absence of the project activity, the baseline scenario would be the use of fossil fuels for meeting similar thermal energy needs, and this baseline is applied in all SSC-CPAs.

Similarly, in accordance with paragraph 10 of AMS-I.E. (version 06.0), it is assumed that in the absence of the project activity, the baseline scenario would be the use of fossil fuels for meeting similar thermal energy needs, and this baseline is applied in all SSC-CPAs.

However, the baseline scenario for either the AMS-II.G. methodology or the combination of the methodologies will be calculated as per the guidelines for the consideration of interactive effects for the application of multiple CDM methodologies for a Programme of Activities, EB68 Annex 3, paragraph 14(a).

B.5. Demonstration of additionality

>> (If the proposed project is not a type of project that is deemed additional, as stated below, then follow guidelines in section 3.5.1 of GS4GG Principles & Requirements to demonstrate additionality.)

The table below is only applicable if the proposed project is deemed additional, as defined by the applied approved methodology or activity requirement or product requirement.

Specify the methodology or activity requirement or product requirement that establish deemed additionality for the proposed project (including the version number and the specific paragraph, if applicable).	Eligibility Criterion – Required condition Additionality for this CPAs is demonstrated according to "Standard for Demonstration of Additionality, Development of Eligibility Criteria and application of multiple methodologies for Programme of Activities", and "Guidelines for the demonstration of additionality of small scale project activities". This CPA having the following characteristics and is thus automatically additional: 1. The ICS disseminated will be isolated units 2. The users of the ICS will be households, or institutions. 3. The size of the each unit will be no larger than 5% of the small-scale CDM thresholds – therefore, each ICS shall have an installed capacity of less than 2.25 MWth and energy saving of less than or equal to 9 GWhth per year. Supporting evidence for inclusion • Manufacturers' specifications of the ICS model • Emission Reduction Calculation Sheet • Copy of Sales Agreements/ Logbooks
Describe how the proposed project meets the criteria for deemed additionality.	This CPA meets the criteria for deemed additionality as: 1. This CPA will be involved in the distribution of various ICS models that have all been certified and have passed the initial rating test according to the ICSEA Rating Test Protocol. These ICS are isolated units as confirmed by the accredited testing laboratories of the ICS. 2. The users of the ICS are households or institutions. The same was confirmed through the CME's copy of the Sales Agreements/ Logbooks. 3. Size of each ICS unit is not larger than 5% of the small-scale CDM thresholds – therefore, each ICS has an installed capacity of 0.003657 MWth which is less than the CDM AMS-I.E. threshold of 2.25 MWth and energy saving of 0.01000692 GWhth which is less than the CDM AMS-II.G. threshold of 9 GWhth per year. The same is confirmed through a review of the 'Additionality' sheets of the Aid Africa CPA CER calculation 01_Aid Africa 6-Brick Wood Stove[19].

[19] 'Additionality' sheet of the Aid Africa CPA CER calculation 01_Aid Africa 6-Brick Wood Stove.

B.6. Sustainable Development Goals (SDG) outcomes

B.6.1. Relevant target for each of the three SDGs

>> (Specify the relevant SDG target for each of three SDGs addressed by the project. Refer most recent version of targets here .)

Category of Impact	Relevance to SDGs	Chosen SDG Target	Indicator Addressed by the Project	Justification Information
Social & Economic	Goal 3 - To ensure healthy lives and promote well being for all at all ages.	Target 3.9 - By 2020, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination.	CME will carry out a household survey to determine the number of disseminated ICS still in use.	The project will reduce the release of pollutants by the lower use of biomass fuels, and reduce exposure to dangerous emissions.
Social & Economic	Goal 7 - To ensure access to affordable, reliable, sustainable and modern energy.	Target 7.1 - By 2030, ensure universal access to affordable, reliable and modern energy services.	CME will carry out a household survey to determine the number of disseminated ICS still in use.	The project will reduce the release of pollutants by the lower use of biomass fuels, and reduce exposure to dangerous emissions.
Social & Economic	Goal 8 – Promote inclusive and sustainable economic growth, employment and decent work for all.	Target 8.2 – Achieve higher levels of economic productivity through diversification, technological upgrading and innovation, including through a focus on high-value added and labour intensive sectors.	CME will use the CPA's employment list to determine increases in employment and will carry out a household survey to determine the number of disseminated ICS still in use which also indicates increase in household income due to ICS fuel savings, providing users with more disposable income.	The project will create opportunities for gainful employment for all, which will result in positive economic outcomes.
Environmental & Ecological	Goal 13 – Take urgent action to combat climate change and its impacts.	Target 13.A – Implement the commitment undertaken by developed-country parties to the United Nations Framework Convention on Climate Change to a goal of mobilizing	CME will check the corresponding Sales Agreements / Logbook records entered into the CPA database.	All project data entrants undergo training to ensure that the information on the Sales Agreement / Logbooks corresponds with the records entered into the database when checked by the CME.

		jointly $ 100 billion annually by 2020 from all sources to address the needs of developing countries in the context of meaningful mitigation actions and transparency on implementation and fully operationalise the Green Climate Fund through its full capitalization as soon as possible.		
Social & Economic	Goal 5 – Achieve gender equality and empower all women and girls.	Target 5.1 – End all forms of discrimination against all women and girls everywhere.	CME will ensure that the CPA has a staff list based on gender, and that all staff training will be done based on gender considerations.	The project has been designed in a participatory way, taking into account the respective roles that men and women play in the targeted communities. The project will create opportunities for everyone by eliminating the barriers to women's participation in social and economic life. All men and women will benefit substantially from the project.

B.6.2. Explanation of methodological choices/approaches for estimating the SDG outcome

>> (Explain how the methodological steps in the selected methodology(ies) or proposed approach for calculating baseline and project outcomes are applied. Clearly state which equations will be used in calculating net benefit.)

This CPA may apply the small-scale baseline and monitoring methodology either AMS-II.G. (version 03) or AMS-I.E. (version 06.0) or a combination of both the methodologies.

Methodological choices for AMS II.G (version 03):

This CPA includes the introduction of ICS. The stoves are small appliances for efficiency improvements in the thermal application of non-renewable biomass. It is assumed that in the absence of the project activity, the baseline scenario would be the use of fossil fuels for meeting similar thermal energy needs.

Methodological choices for AMS I.E (version 06.0):

This CPA includes the introduction of renewable energy technologies (improved cooking stoves or "ICS") and renewable biomass to switch fuel from non-renewable biomass to renewable biomass. It is assumed that in the absence of the project activity, the baseline scenario would be the use of fossil fuels for meeting similar thermal energy needs.

The CME will use the separate values for the two baseline parameters B_{old} and B_y. In the light of EB68 Annex 3 "Guidelines for the consideration of interactive effects for the application of multiple CDM methodologies for a Programme of Activities", paragraph 14(a), the approach to combine the two methodologies is as follows:

B_{old} is the baseline parameter of AMS-II.G, whereas B_y is calculated using the formula: $B_y = N_{AMS-I.E.} * (B_{old} - B_{y,\ savings})$ which follows paragraph 14(a)(ii) where adjusted values are required as follows: The value is 3.146 tonnes/stove/year for B_{old}, and 2.172 tonnes/stove/year for $B_{y,\ savings}$. Thus the estimate for B_y is 0.920 tonnes/stove/year.

AMS-I.E's parameter $N_{AMS-I.E.}$ is the number of operational ICS using AMS-I.E, calculated as:

$$N_{AMS-I.E.} = U_{(i,j)\ AMS-I.E.} \times t_{fraction(I,j),\ AMS-I.E}$$

Thus, depending upon the choice of applied methodology by this CPA, the emission reductions from the use of ICS would be calculated as follows:

1. Equations for calculations of ERs as per AMS-II.G. (version 03):

   a. Baseline Emissions:

$$ER_y = B_{y,savings} \times f_{NRB,y} \times NCV_{biomass} \times EF_{projected\text{-}fossilfuel}$$

Where:

ER_y	=	Emission reductions during the year y in tCO2e
$B_{y,savings}$	=	Quantity of woody biomass that is saved in tonnes
$f_{NRB,y}$	=	Fraction of woody biomass saved by the project activity in year y that can be established as non-renewable biomass
$NCV_{biomass}$	=	Net calorific value of the non-renewable woody biomass that is substituted. The IPCC default for wood fuel, 0.015 TJ/tonne is applied
$EF_{projected\text{-}fossilfuel}$	=	Emission factor for the substitution of non-renewable woody biomass by similar consumers. As per methodology, a value of 81.6 tCO_2/TJ is employed.

$B_{y,savings}$ is calculated as follows:

$$B_{y,savings} = \sum_{j=1}^{n}\sum_{i=1}^{n} B_{y,\,savings,\,(i,\,j)}$$

Where:

i	=	Model of ICS which is a specified size of an ICS type or a group of sizes of an ICS type
j	=	Cohort for each model of ICS. A cohort is defined as the ICS model sold or gone through maintenance in the same year *y*
$B_{y,savings,(i,j)}$	=	Quantity of woody biomass that is saved in tonnes per model and cohort of ICS

$B_{y,savings,(i,j)}$ is calculated per model and cohort of ICS as the savings directly depend on the efficiencies of each model and cohort of ICS. The savings in woody biomass can be calculated in any of the following three approved options. The decision on which of the options to choose for each CPA will be taken at CPA level for each CPA.

The Option 2 of B.6.1 of part II of PoA-DD is chosen to calculate the $B_{y,savings,(i,j)}$ of the ICS:

This option compares the efficiency of the baseline stove against the efficiency of the ICS deployed.

$$B_{y,savings,(i,j)} = B_{old,(i,j)} \times (1 - \eta_{old,i} / \eta_{new,(i,j)})$$

Where:

$B_{,old,(i,j)}$	=	Quantity of woody biomass used in the absence of the project activity in tonnes per model and cohort of ICS
$\eta_{old,i}$	=	Efficiency of the baseline system/s being replaced, measured using representative sampling methods or based on referenced literature values (fraction), use weighted average values if more than one type of system is being replaced. A default value of 0.10 may be optionally used if the replaced system is three stone fire, or conventional system with no improved combustion air supply or flue gas ventilation system i.e., without a grate as well as a chimney; for other types of system a default value of 0.2 may be optionally used
$\eta_{new,(i,j)}$	=	Efficiency of the system being deployed as part do the project activity (fraction), as determined using the Water Boiling Test (WBT) protocol. Use weighted average values if more than one type of system is being introduced by the project activity.

$B_{old,(i,j)}$ is determined using option (a) in the methodology; by calculating the product of the number of systems multiplied by the estimated average annual consumption of woody biomass per appliance (tonnes/year).

$$B_{old,(i,j)} = N_{(i,j)} \cdot C_{y,\,fueltype,\,region} \cdot L_{(i,j)}$$

Where:

$N_{(i,j)}$	=	Number of systems per cohort and model
$C_{y,fueltype,region,old}$	=	Estimate of average annual consumption of woody biomass per appliance (tonnes/year) derived from a survey of local usage
$L_{(i,j)}$	=	Leakage, the fraction by which emission reductions are multiplied to obtain an assessment adjusted for leakage risks

The number of systems ($N_{(i,j)}$) is determined as the fraction of days in a year in use for each ICS of the same model and cohort ($t_{fraction,y,(i,j)}$), by the fraction of these ICS to be still in use per cohort and model of ICS.

$$N_{(i,j)} = U_{(i,j)} \cdot \sum_{(i,j)=1}^{n} t_{fraction,\,y,\,(i,j)}$$

Where:

$U_{(i,j)}$	=	Usage, the fraction to adjust for drop off of ICS per cohort and model
$t_{fraction,y,(i,j)}$	=	Fraction of the days in use in year y of a single ICS deployed per cohort and model

When a CPA is included in this PoA the variables have to be determined or measured for the region included in the PoA and/or each model of ICS used as applicable.

b. Leakage:

According to paragraph 13 & 23 of AMS-II.G. (version 03) the following sources of leakage have to be assessed:

a) *The use/diversion of non-renewable biomass saved under the project activity by non-project households/users who previously used renewable energy sources. If this leakage assessment quantifies an increase in the use of non-renewable biomass used by the non-project households/users, that is attributable to the project activity then B_{old} is adjusted to account for the quantified leakage.*

b) *Use of non-renewable 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 biomass saved under the project activity that is then used as the baseline of another CDM project activities then B_{old} is adjusted to account for the quantified leakage.*

c) *Increase in the use of non-renewable biomass outside the project boundary to create non-renewable biomass baselines can also be a potential source of leakage. If this leakage*

assessment quantifies an increase in the use of non-renewable biomass outside the project boundary then B_{old} is adjusted to account for the quantifiable leakage.

All the CPAs under this SSC-PoA will use the net to gross adjustment factor of 0.95 to address leakages.

Furthermore, as per paragraph 14 of AMS II.G (version 03), if the equipment currently being utilised is transferred from outside the boundary to the project boundary, leakage is to be considered. The ICS to be disseminated in the PoA do not include any equipment in operation outside the project boundary but exclusively project-specific ICS, therefore no currently utilised equipment will be transferred from outside the boundary to the project activity and this source of leakage can be neglected.

2. Equations for calculations of ERs as per AMS-I.E. (version 06.0):

a. Baseline Emissions:

$$ER_y = B_y \times f_{NRB,y} \times NCV_{biomass} \times EF_{projected_fossil_fuel} - PE_{BC,y}$$ Equation (1) of AMS-I.E.

Where:

ER_y = Emission reductions during the year *y* in t CO_2e

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[20]

$NCV_{biomass}$ = 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 CO_2/TJ[21]

[20] Default values endorsed by designated national authorities and approved by the Board are available at <http://cdm.unfccc.int/DNA/fNRB/index.html>.

[21] This value represents the emission factor of the substitution fuels likely to be used by similar users, on a weighted average basis. It is assumed that the mix of present and future fuels used would consist of a solid fossil fuel (lowest in the ladder of fuel choices), a liquid fossil fuel (represents a progression over solid fuel in the ladder of fuel use choices) and a gaseous fuel (represents a progression over liquid fuel in the ladder of fuel use choices). Thus a 50 per cent weight is assigned to coal as the alternative solid fossil fuel (96 t CO_2/TJ) and a 25 per cent weight is assigned to both liquid and gaseous fuels (71.5 t CO_2/TJ for kerosene and 63.0 t CO_2/TJ for liquefied petroleum gas (LPG).

$PE_{BC,y}$ = Project emissions due to cultivation of biomass

B_y is determined by 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; or

This CPA uses option (a) above in accordance with paragraph 12 (a) of AMS.I.E (version 06.0).

Specific renewable energy based water treatment technologies are not included under this CPA.

This CPA does not involve sourcing of biomass from dedicated plantations.

Differentiation between non-renewable and renewable woody biomass (as per AMS-II.G. and AMS-I.E)

The shares of renewable and non-renewable woody biomass in B_y (the quantity of woody biomass used in the absence of the project activity) the total biomass consumption using nationally approved methods (e.g. surveys or government data if available) and then the parameter $f_{NRB,y}$ shall be determined as described below. The following principles shall be taken into account:

Demonstrably renewable woody biomass[22] (DRB):

Woody[23] biomass is "renewable" if one of the following two conditions is satisfied:

(a) The woody biomass is originating from land areas that are forests[24] 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[25] 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;

[22] This definition uses elements of EB 23, annex 18.

[23] In cases of charcoal produced from woody biomass, the demonstration of renewability shall be done for the areas where the woody biomass is sourced.

[24] The forest definitions as established by the country in accordance with the decisions 11/CP.7 and 19/CP.9 should apply.

[25] Carbon stocks may be estimated following the procedures described in the methodological tool "Project and leakage emissions from biomass".

(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:

(c) 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;

(d) 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;

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

(f) Trends in the types of cooking fuel collected 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:

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

Equation (6) of AMS-II.G. and (4) of AMS-I.E.

Evidence shall be provided that the trends identified are not occurring due to the enforcement of local/national regulations.

b. Leakage Emissions:

For stoves using renewable biomass (under AMS-I.E.) in this CPA, leakage emissions due to diversion of biomass residues is applicable and the same will be determined in accordance with provisions of methodological tool "**Project and leakage emissions from biomass (version 02.0)**", as follows:

1. Leakage due to diversion of biomass residues from other applications:

This section is applicable for project activities, which utilize biomass residues. It quantifies leakage due to diversion of biomass residues to the project to be used as either fuel or feedstock. These biomass residues could have been used outside the project boundary in competing applications, and due to the implementation of the project activity these competing application might be forced to use inputs, which are not carbon neutral.

1.1. Determination of the alternative scenario of the biomass residues in absence of the project activity:

In accordance with the Methodological Tool: Project and leakage emissions from biomass, version 02.0, this CPA will demonstrate either option B1, B2, or B3, or any combination of these, at the time of verification of the CPA after the findings of a biomass usage survey, with an ex-post leakage value for the ER calculation.

For biomass residues categories for which scenarios B1, B2 or B3 are deemed a plausible alternative scenario, it shall be demonstrated that this is a realistic and credible alternative scenario. Towards this end one of the following procedures will be applied for the combined amount of biomass identified:

(i) *Demonstrate that there is an abundant surplus of the biomass residue in the project region, which is not utilized. For this purpose, demonstrate that the total quantity of that type of biomass residues annually available in the project region is at least 25 per cent larger than the quantity of biomass residues which is utilized annually in the project region (e.g. for energy generation or as feedstock), including the project facility;*

(ii) *Demonstrate for the sites from where biomass residues are sourced that the biomass residues have not been collected or utilized (e.g. as fuel, fertilizer or feedstock) but have been dumped and left to decay, land-filled, left in the field to decay after harvest, or burnt[26] without energy generation (e.g. field burning). This approach is only applicable to biomass residues categories for which project participants can clearly identify the site from where the biomass residues are sourced;*

(iii) *In case abundance of biomass in the project region cannot be demonstrated, the alternative use of the biomass shall be considered unknown (B4) and result in leakage emissions.*

During the crediting period, biomass residues of the type B1, B2 or B3 may be used in the project activity and the alternative scenario for these types of biomass residues shall be assessed using the procedures outlined in this tool for each new category of biomass residues.

1.2. Calculation of Leakage due to diversion of biomass residues:

The main potential source of leakage due to biomass residues is an increase in emissions from fossil fuel combustion or other sources due to diversion of biomass residues from other uses to the project plant as a result of the project activity. The alternative scenario for biomass residues for which this potential leakage is relevant is B4.

Therefore, for the categories of biomass residues whose alternative scenario has been identified as B4, project participants shall calculate leakage emissions as follows:

[26] Assumed nil for this example, but a real case would be based on a SO's defined group of renewable biomass users

$$LE_{BR,y} = EF_{CO2,LE} \times \sum_{n} BR_{PJ,n,y} \times NCV_{n,y}$$ Equation (9)

Where:

$LE_{BR,y}$ = Leakage emissions in year *y* (t CO2e)

$EF_{CO2,LE}$ = CO2 emission factor of the most carbon intensive fossil fuel used in the country (t CO2/GJ)

$BR_{PJ,n,y}$ = Quantity of biomass residues used in the project site and included in the project boundary in year *y* (tonnes on dry-basis)

$NCV_{n,y}$ = Net calorific value of the biomass residues of category *n* in year *y* (GJ/tonne of dry matter)

n = Categories of biomass residues for which B4 has been identified as the alternative scenario

The determination of *BRPJ,n,y* shall be based on the monitored amounts of biomass residues used in facilities included in the project boundary.

B.6.3. Data and parameters fixed ex ante for monitoring contribution to each of the three SDGs

(Include a compilation of information on the data and parameters that are not monitored during the crediting period but are determined before the design certification and remain fixed throughout the crediting period like IPCC defaults and other methodology defaults. Copy this table for each piece of data and parameter.)

Relevant SDG Indicator	Goal 3 - To ensure healthy lives and promote well being for all at all ages. Indicator: Air Quality Goal 7 - To ensure access to affordable, reliable, sustainable and modern energy. Indicator: Access to affordable and clean energy services Goal 13 – Take urgent action to combat climate change and its impacts. Indicator: ICS Quality
Data / Parameter:	**$NCV_{biomass}$**
Unit:	TJ/tonne
Description:	Net calorific value of the non-renewable woody biomass that is substituted

Source of data:	IPCC default for wood fuel
Value(s) applied:	0.015
Choice of data or Measurement methods and procedures:	Default value that is provided in in accordance with paragraph 5 of AMS II.G (version 03) and paragraph 11 of AMS-I.E. (version 06.0)
Purpose of data	Calculation of baseline emissions
Additional comment:	As per AMS-II.G. and AMS-I.E.

Relevant SDG Indicator	Goal 3 - To ensure healthy lives and promote well being for all at all ages. Indicator: Air Quality Goal 7 - To ensure access to affordable, reliable, sustainable and modern energy. Indicator: Access to affordable and clean energy services Goal 13 – Take urgent action to combat climate change and its impacts. Indicator: ICS Quality
Data / Parameter:	$EF_{projected\text{-}fossilfuel}$
Unit:	tCO_2/TJ
Description:	Emission factor for the substitution of non-renewable woody biomass by similar consumers.
Source of data:	IPCC
Value(s) applied:	81.6
Choice of data or Measurement methods and procedures:	Default value in accordance with paragraph 5 of AMS II.G (version 03) and paragraph 11 of AMS-I.E. (version 06.0)
Purpose of data	Calculation of baseline emissions
Additional comment:	As per AMS-II.G. and AMS-I.E.

Relevant SDG Indicator	Goal 3 - To ensure healthy lives and promote well being for all at all ages. Indicator: Air Quality Goal 7 - To ensure access to affordable, reliable, sustainable and modern energy. Indicator: Access to affordable and clean energy services Goal 13 – Take urgent action to combat climate change and its impacts. Indicator: ICS Quality
Data / Parameter:	$C_{y,fueltype,region,old}$
Unit:	tonnes/year
Description:	Quantity of woody biomass used in the absence of the project activity in tonnes per type of ICS within a region.
Source of data:	Center for Integrated Research and Community Development Uganda (CIRCODU), Final Report on Baseline Fuel Consumption in Households in Uganda, April 2010 (revised October 2010). CDM ASB0016 Standardized Baseline Institutional Cook Stoves in Uganda v01.
Value(s) applied:	Domestic stoves: • 4.58 tonnes of woody biomass per household per year for charcoal-burning stoves (calculated from 2.09 kg/stove/day with a conversion factor of 6) • 3.50 tonnes of woody biomass per household per year for wood-burning stoves (calculated from 9.6 kg/stove/day) Institutional stoves: • 0.38 tonnes of woody biomass per person per year for boarding schools; • 0.19 tonnes of woody biomass per person per year for day schools; and • 0.59 tonnes of woody biomass per person per year for prisons, plantation estates, and hospitals
Choice of data or Measurement methods and procedures:	Estimate of average annual consumption of woody biomass per appliance (tonnes/year) derived from a survey of local usage or historical data. If data were obtained by survey, then the survey follows the representative sampling methods as described in paragraph 22 of AMS II.G. (version 03) and paragraph 26 of AMS-I.E. (version 06.0).

Purpose of data	Calculation of baseline emissions
Additional comment:	Only applicable for calculations of ER as per AMS-II.G. (version 03).

Relevant SDG Indicator	Goal 3 - To ensure healthy lives and promote well being for all at all ages. Indicator: Air Quality Goal 7 - To ensure access to affordable, reliable, sustainable and modern energy. Indicator: Access to affordable and clean energy services Goal 13 – Take urgent action to combat climate change and its impacts. Indicator: ICS Quality
Data / Parameter:	$L_{(i,j)}$
Unit:	Fraction
Description:	Net to Gross adjustment factor to account for leakage
Source of data:	Default value in accordance with paragraph 13 (a) of AMS II.G (version 03) and paragraph 19 (a) of AMS-I.E. (version 06.0)
Value(s) applied:	0.95
Choice of data or Measurement methods and procedures:	N/A
Purpose of data	Calculation of leakage emissions
Additional comment:	In case this leakage adjustment factor is applied, it is not required to survey the use/diversion of non-renewable woody biomass saved under the project activity by non-project households/users that previously used renewable energy sources.

Relevant SDG Indicator	Goal 3 - To ensure healthy lives and promote well being for all at all ages. Indicator: Air Quality Goal 7 - To ensure access to affordable, reliable, sustainable and modern energy. Indicator: Access to affordable and clean energy services Goal 13 – Take urgent action to combat climate change and its impacts. Indicator: ICS Quality
Data / Parameter:	**$Capacity_{ICS}$**
Unit:	kW_{th}
Description:	Installed/rated capacity of stove in kilowatt equivalent for thermal energy
Source of data:	WBT data sheet for the Aid Africa 6-Brick Wood Stove Test Certificate
Value(s) applied:	3.657 kW_{th}
Choice of data or Measurement methods and procedures:	Either data from stove manufacturer or calculated in a transparent manner. The calculation will vary depending on the most appropriate data source and therefore will be detailed on CPA level and described by stove type.
Purpose of data	Calculation of baseline emissions
Additional comment:	To ensure that the total rated capacity of all the stoves in the CPA do not exceed the relevant limit, $45MW_{th}$ per CPA.

Relevant SDG Indicator	Goal 3 - To ensure healthy lives and promote well being for all at all ages. Indicator: Air Quality Goal 7 - To ensure access to affordable, reliable, sustainable and modern energy. Indicator: Access to affordable and clean energy services Goal 13 – Take urgent action to combat climate change and its impacts. Indicator: ICS Quality
Data / Parameter:	**$\eta_{old,i}$**
Unit:	Fraction

Description:	Efficiency of the baseline appliance being replaced
Source of data:	Representative sampling testing based on Water Boiling Tests or any other test approved by the UNFCCC, referenced literature or default values according to the methodology AMS II.G (version 03) and AMS-I.E. (version 06.0).
Value(s) applied:	Default value (0.1 for domestic) according to the methodology, and (0.121 for institutional stoves) according to the Uganda standardized baseline for IICS
Choice of data or Measurement methods and procedures:	Default value according to the methodology may apply, or results from testing in a laboratory may apply.
Purpose of data	Calculation of baseline emissions
Additional comment:	This parameter may or not may be reported according to the option selected at CPA level for the estimation of emission reductions. Data to be reported if option 2 of AMS-II.G. (version 03) is chosen is chosen.

Relevant SDG Indicator	Goal 3 - To ensure healthy lives and promote well being for all at all ages. Indicator: Air Quality Goal 7 - To ensure access to affordable, reliable, sustainable and modern energy Indicator: Access to affordable and clean energy services Goal 13 – Take urgent action to combat climate change and its impacts. Indicator: ICS Quality
Data / Parameter:	$\eta_{new,(i,j)}$
Unit:	Fraction
Description:	Specific efficiency of the ICS being deployed as part of the project activity.
Source of data:	Representative sampling testing based on Water Boiling Tests or any other test approved by the UNFCCC, or referenced literature

Value(s) applied	32.3%
Measurement methods and procedures:	ICS are tested by a laboratory according to the WBT ex ante and ex post as part of the monitoring. The specified efficiency of ICS may also change over the lifetime of the stove, normally decreasing over the time. Therefore the specified efficiency of a ICS is a range of values where its lower limit is an efficiency of 20% in comparison with $\eta_{old,i}$ and its higher limit is a 10% higher than the ex- ante value presented in the CPA-DD. The ICS to be tested according to the monitoring plan will be randomly selected from the usage sample survey. Tests during monitoring will be performed by an authorised organisation at least every two years.
Monitoring frequency:	Annual or Biennial
QA/QC procedures:	Tests during monitoring will be performed by the CME and/or by an authorised organisation designated by the CME. Cross checks on the CME or authorised organisations will be made annually by comparisons of control stoves.
Purpose of data	Calculation of baseline emissions
Additional comment:	This parameter may or may not be monitored according to the option selected at CPA level for the calculation of emission reductions.

B.6.4. Ex ante estimation of outcomes linked to each of the three SDGs

>> (Provide a transparent ex ante calculation of baseline and project outcomes (or, where applicable, direct calculation of net benefit) during the crediting period, applying all relevant equations provided in the selected methodology(ies) or as per proposed approach. For data or parameters available before design certification, use values contained in the table in section B.6.3 above. For data/parameters not available before design certification and monitored during the crediting period, use estimates contained in the table in section B.7.1 below)

Emission reductions are calculated as follows:

$ER_y = ER_{AMS\text{-}II.G,y} + ER_{AMS\text{-}I.E,y}$	Equation 10

Where:

ER_y = Emission reductions during year *y* in t CO_2e

$ER_{AMS\text{-}II.G,y}$ = Emission reductions during year *y* in t CO_2e from AMS-II.G.

$ER_{AMS\text{-}I.E.y}$ = Emission reductions during year *y* in t CO_2e from AMS-I.E.

The calculation of emission reductions is based on the individual stoves/stove cohort. The example calculation below is therefore shown for one stove. The sum of the emission reductions of all stoves results in the total emission reduction achieved within a specific monitoring period.

For the example calculation it is assumed that the stove was operated for a period of 365 days fuelled with renewable biomass not sourced from the cultivation of biomass in a dedicated plantation. The calculation is done for 365 days following AMS-I.E. and AMS-II.G. as follows:

ID	Description	Unit	Source / calculated as	Value	Example
Calculation as per AMS-II.G.					
A	Crediting days	D	Monitored	CPA specific	365
B	Days in full year	D	Monitored	365, 366	365
C	$t_{fraction(i,j)}$	Fraction	A/B	CPA specific	1.000
D	$U_{(i,j)}$	Fraction	Monitored	CPA specific	0.945
E	$N_{(i,j)}$	Fraction	C*D	CPA specific	0.945
F	Leakage	Fraction	AMS-II.G. (Default value)	0.95	0.95
G	$C_{y,fueltype,region,old}$	tonnes/stove/y	Baseline study (CIRCODU)	CPA specific	3.504
H	B_{old} (AMS-II.G.)	tonnes/y	E*F*G	CPA specific	3.146
I	Efficiency new	Fraction	Monitored	CPA specific	0.323
J	Efficiency old	Fraction	AMS-II.G. (Default value)	0.1	0.1
K	Fuel savings	Fraction	1-J/I	CPA specific	0.69
L	$B_{y,savings}$	tonnes/y	H*K	CPA specific	2.172
M	fNRB (national)	Fraction	Baseline study	Country	0.92

			(FAO, National Forestry Authority approved)	specific	
N	NCV	TJ/tonne	AMS-II.G. (Default value)	0.015	0.015
O	EF	tCO_2e/TJ	AMS-II.G. (Default value)	81.6	81.6
P	ER per stove w/o adjustment	tCO_2e/stove	L*M*N*O	CPA specific	2.446
Q	Adjustment for continued use of BL stoves	Fraction	Monitored	CPA specific	0.999
R	ER per stove with adjustment (under AMS-II.G)	tCO_2e/stove	P*Q	CPA specific	2.443
Calculation as per AMS-I.E.					
A_2	Crediting days using RB	D	Monitored	CPA specific	365
B	Days in full year	D	Monitored	365, 366	365
C_2	$t_{fraction(i,j),\ AMS-I.E}$	Fraction	A_2/B	CPA specific	1.000
D	$U_{(i,j),\ AMS-I.E}$	Fraction	Monitored	CPA specific	0.945
E_2	$N_{AMS-I.E}$	Fraction	C_2*D	CPA specific	0.945
F_2	$B_{old,} - B_{y,savings,}$	tonnes/stove/y	$B_{old,} - B_{y,savings,}$	CPA specific	0.974
G_2	B_y	tonnes/y	E_2*F_2 (AMS-I.E. baseline emissions for B_y calculation, EB68 Annex 3 para 14.	CPA specific	0.920
L_2	fNRB (national)	fraction	Baseline study (FAO & National Forestry Authority	Country specific	0.92

			approved)		
M	NCV	TJ/tonne	AMS-I.E. (Default value)	0.015	0.015
N	EF	tCO_2e/TJ	AMS-I.E. (Default value)	81.6	81.6
O_2	Leakage	Fraction	AMS-I.E. v.6. clause 19 (a)	0.95	0.95
P_2	Project Emissions[27]	tCO_2e/stove	Calculated as per tool for Project emissions resulting from utilization of biomass residues	CPA specific	0
Q_2	Total ER per stove	tCO_2e/stove	$(G_2*L_2*M*N*O_2) - P_2$	CPA specific	0.985
Total emission reductions as per AMS-II.G. and AMS-I.E.					
S	Total ER per stove	tCO_2e/stove	$R+Q_2$	CPA specific	3.428

The number of crediting days under AMS-II.G. and AMS-I.E. shall not exceed the number of days in the crediting period.

[27] Assumed nil for this example, but a real case would be based on a SO's defined group of renewable biomass users

B.6.5. Summary of ex ante estimates of each SDG outcome

AMS-II.G. stoves using NRB

Year	Baseline estimate	Project estimate	Leakage	Net benefit
Year 1	45,859	0	2,184	43,675
Year 2	45,859	0	2,184	43,675
Year 3	45,859	0	2,184	43,675
Year 4	45,859	0	2,184	43,675
Year 5	45,859	0	2,184	43,675
Year 6	45,859	0	2,184	43,675
Year 7	45,859	0	2,184	43,675
Total	321,013	0	15,286	305,727
Total number of crediting years	7 Years			
Annual average over the crediting period	45,859	0	2,184	43,675

AMS-II.G. + AMS-I.E. combination stoves using RB

Year	Baseline estimate	Project estimate	Leakage	Net benefit
Year 1	44,288	0	2,109	42,179
Year 2	44,288	0	2,109	42,179
Year 3	44,288	0	2,109	42,179
Year 4	44,288	0	2,109	42,179
Year 5	44,288	0	2,109	42,179
Year 6	44,288	0	2,109	42,179
Year 7	44,288	0	2,109	42,179

Total	310,016	0	14,763	295,253
Total number of crediting years	7 Years			
Annual average over the crediting period	44,288	0	2,109	42,179

Combined total AMS-II.G. only stoves using NRB plus AMS-II.G. + AMS-I.E. combination stoves using RB

Year	Baseline estimate	Project estimate	Leakage	Net benefit
Year 1	90,147	0	4,293	85,854
Year 2	90,147	0	4,293	85,854
Year 3	90,147	0	4,293	85,854
Year 4	90,147	0	4,293	85,854
Year 5	90,147	0	4,293	85,854
Year 6	90,147	0	4,293	85,854
Year 7	90,147	0	4,293	85,854
Total	631,028	0	30,049	600,979
Total number of crediting years	7 Years			
Annual average over the crediting period	90,147	0	4,293	85,854

B.7. Monitoring plan

B.7.1. Data and parameters to be monitored

(Include specific information on how the data and parameters that need to be monitored in the selected methodology(ies) or proposed approaches or as per mitigation measures from safeguarding principles assessment or as per feedback from stakeholder consultations would actually be collected during monitoring. Copy this table for each piece of data and parameter.)

Relevant SDG Indicator	Goal 3 - To ensure healthy lives and promote well being for all at all ages. Indicator: Air Quality Goal 7 - To ensure access to affordable, reliable, sustainable and modern energy. Indicator: Access to affordable and clean energy services Goal 13 – Take urgent action to combat climate change and its impacts. Indicator: ICS Quality
Data / Parameter:	N_y
Unit:	Unit
Description:	Number of ICS units distributed
Source of data:	CPA database
Value(s) applied	[XXX]
Measurement methods and procedures:	Monthly submissions of Sales Agreements/Logbooks and data entries by CPA
Monitoring frequency:	Annual
QA/QC procedures:	This factor will be monitored according to the monitoring plan, and updated when necessary. Cross check comparisons will be made against spot check visits and monitoring of a randomly selected sample of households to administer the usage survey questionnaire, and any significant differences will be counted as "Drop-Offs".
Purpose of data	Calculation of baseline emissions
Additional comment:	As per AMS-II.G. and AMS-I.E.

Relevant SDG Indicator	Goal 3 - To ensure healthy lives and promote well being for all at all ages. Indicator: Air Quality Goal 7 - To ensure access to affordable, reliable, sustainable and modern energy. Indicator: Access to affordable and clean energy services Goal 13 – Take urgent action to combat climate change and its impacts. Indicator: ICS Quality
Data / Parameter:	$U_{(i,j)\ AMS\text{-}I.E}$
Unit:	Fraction
Description:	The fraction by which emission reductions are multiplied to obtain an adjustment for drop off of ICS in use per cohort year that are using renewable biomass. A cohort is defined as the ICS model sold or gone through maintenance in the same year.
Source of data:	Survey of ICS users per cohort that use renewable biomass as the main source of fuel, using sampling methods.
Value(s) applied	[XXX]
Measurement methods and procedures:	The SO keeps a paper and electronic record and a survey is done at least biennially in order to assess the operational ICS use of renewable biomass. This factor addresses the leakage to be considered as per AMS-I.E/Version 06.
Monitoring frequency:	Annual or biennial
QA/QC procedures:	Usage monitoring will be performed by the CME and/or by an authorised organisation designated by the CME following the sampling plan. In all cases cross-checking procedures appropriate to the monitoring choice will be undertaken.
Purpose of data	Calculation of leakage emissions
Additional comment:	

Relevant SDG Indicator	Goal 3 - To ensure healthy lives and promote well being for all at all ages. Indicator: Air Quality Goal 7 - To ensure access to affordable, reliable, sustainable and modern energy. Indicator: Access to affordable and clean energy services Goal 13 – Take urgent action to combat climate change and its impacts. Indicator: ICS Quality
Data / Parameter:	$t_{fraction,(i,j)}$, AMS-I.E
Unit:	Fraction of 365
Description:	Fraction of the days in use in year y of a single ICS deployed that uses renewable biomass
Source of data:	Derived from sales records and SOs standard operating procedures
Value(s) applied	[XXX]
Measurement methods and procedures:	The SO keeps a paper and electronic record of the sales date, and the stove is considered to be in use from the commissioning date, which is the date on which the stove is put into use for the first time. The number of operational stoves each year will be summarised in a table and checked to ensure that the installed capacity of each CPA does not exceed the small-scale limit of 45 MW_{th} output per year. This factor will be calculated daily through the electronic database. The SO also provides a standard operating procedure, certifying the date that household made a shift from the use of non-renewable biomass to renewable biomass as their primary source of fuel.
Monitoring frequency:	Continuously, (reported annually)

QA/QC procedures:	Sales records will be scrutinised by the SO to avoid double-counting and the CME will also conduct spot-checks to verify the legitimacy of such records. On a monthly basis, SOs will verify the stoves put into use based on the ICS sales during the month through telephone surveys or physical inspection/verification or third party monitoring events. These monitoring events may include a record of one or a combination of the following activities or events: (a) Customer inspections resulting from loan or hire purchase agreements (b) Double verified records of community-based stove monitoring staff (c) Independent monitoring verification exercises organised by the CME. This will provide the date on which the stove is put into use for the first time and will be used as the start date for the computation of certified emission reductions. On a monthly basis, CPAs will send duplicate copies of sales agreements to ICSEA for verification of the data entered into the sales database. This will also provide the date on which the operational stove started using renewable biomass for the first time and will be used as the start date for the computation of certified emission reductions. On a monthly basis, CPAs will send duplicate copies of sales agreements to ICSEA for verification of the data entered into the sales database. Telephone checks and spot checks will be used by the CME to review and authenticate the data in the sales database. An ICS not found to be in use during the course of the monitoring period, will be suspended from the sales database until it is verified to be in use. If it is not found to be in use before the annual verification, it will not be included in the sales database and will not earn carbon credits for that monitoring period. This data will also be used to determine the number of ICS installed in the CPA. An operational ICS not found to be using renewable biomass after having being identified by the SO under its standard operating procedures as one that has shifted its fuel use from non-renewable to renewable biomass, shall only be included in the sales database as ICS applying AMS-II.G.
Purpose of data	Calculation of baseline emissions
Additional comment:	

Relevant SDG Indicator	Goal 3 - To ensure healthy lives and promote well being for all at all ages. Indicator: Air Quality Goal 7 - To ensure access to affordable, reliable, sustainable and modern energy. Indicator: Access to affordable and clean energy services Goal 13 – Take urgent action to combat climate change and its impacts. Indicator: ICS Quality
Data / Parameter:	$f_{NRB,y}$
Unit:	Fraction
Description:	Fraction of woody biomass saved by the project activity in the year y that can be established as non-renewable biomass
Source of data:	National forestry agencies, default values and environmental authorities literature or statics (e.g. FAO)
Value(s) applied	[XXX]
Measurement methods and procedures:	The $f_{NRB,y}$ will be determined for each CPA based on the most recent national approved studies or African studies; where available, a regional approach will be used to determine $f_{NRB,y}$. At least once a year the parameter will be monitored. By updating the value at least once a year, leakage b) is taken into consideration
Monitoring frequency:	Annual
QA/QC procedures:	This factor will be monitored according to the monitoring plan, and updated when necessary. Cross check comparisons will be made against UNFCCC published default values, and any significant differences will be justified.
Purpose of data	Calculation of baseline emissions
Additional comment:	As per AMS-II.G. and AMS-I.E.

Relevant SDG Indicator	Goal 3 - To ensure healthy lives and promote well being for all at all ages. Indicator: Air Quality Goal 7 - To ensure access to affordable, reliable, sustainable and modern energy. Indicator: Access to affordable and clean energy services Goal 13 – Take urgent action to combat climate change and its impacts. Indicator: ICS Quality
Data / Parameter:	$\eta_{new,(i,j)}$
Unit:	Fraction
Description:	Specific efficiency of the ICS being deployed as part of the project activity.
Source of data:	Representative sampling testing based on Water Boiling Tests or any other test approved by the UNFCCC, or referenced literature
Value(s) applied	[XXX]
Measurement methods and procedures:	ICS are tested by a laboratory according to the WBT ex ante and ex post as part of the monitoring. The specified efficiency of ICS may also change over the lifetime of the stove, normally decreasing over the time. Therefore the specified efficiency of a ICS is a range of values where its lower limit is an efficiency of 20% in comparison with $\eta_{old,i}$ and its higher limit is a 10% higher than the ex- ante value presented in the CPA-DD. The ICS to be tested according to the monitoring plan will be randomly selected from the usage sample survey. Tests during monitoring will be performed by an authorised organisation at least every two years.
Monitoring frequency:	Annual or Biennial
QA/QC procedures:	Tests during monitoring will be performed by the CME and/or by an authorised organisation designated by the CME. Cross checks on the CME or authorised organisations will be made annually by comparisons of control stoves.
Purpose of data	Calculation of baseline emissions
Additional comment:	This parameter may or may not be monitored according to the option selected at CPA level for the calculation of emission reductions.

Relevant SDG Indicator	Goal 3 - To ensure healthy lives and promote well being for all at all ages. Indicator: Air Quality Goal 7 - To ensure access to affordable, reliable, sustainable and modern energy. Indicator: Access to affordable and clean energy services Goal 13 – Take urgent action to combat climate change and its impacts. Indicator: ICS Quality
Data / Parameter:	$t_{fraction,(i,j)}$
Unit:	Fraction of 365
Description:	Fraction of the days in use in year y of a single ICS deployed
Source of data:	Derived from sales records
Value(s) applied	[XXX]
Measurement methods and procedures:	The SO keeps a paper and electronic record of the sales date, and the stove is considered to be in use from the commissioning date, which is the date on which the stove is put into use for the first time. The number of operational stoves each year will be summarised in a table and justified by comparing the efficiency savings of each CPA to the small-scale limit of savings of 180 GWh_{th} per year. This factor will be calculated daily through the electronic database.
Monitoring frequency:	Continuously, (reported annually)

QA/QC procedures:	Sales records will be scrutinised by the SO to avoid double-counting and the CME will also conduct spot-checks to verify the legitimacy of such records. On a monthly basis, SOs will verify the stoves put into use based on the ICS sales during the month through telephone surveys or physical inspection/verification or third party monitoring events. These monitoring events may include a record of one or a combination of the following activities or events: (a) Customer inspections resulting from loan or hire purchase agreements (b) Double verified records of community-based stove monitoring staff (c) Independent monitoring verification exercises organised by the CME. This will provide the commissioning date, which is the date on which the stove is put into use for the first time and will be used as the start date for the computation of certified emission reductions. On a monthly basis, CPAs will send duplicate copies of sales agreements to ICSEA for verification of the data entered into the sales database. Telephone checks and spot checks will be used by the CME to review and authenticate the data in the sales database. An ICS not found to be in use will be suspended from the sales database until it is verified to be in use. If it is not found to be in use before the annual verification, it will not be included in the sales database and may be deleted and replaced with a new ICS. This data will also be used to determine the number of ICS installed in the CPA.
Purpose of data	Calculation of baseline emissions
Additional comment:	

Relevant SDG Indicator	Goal 3 - To ensure healthy lives and promote well being for all at all ages. Indicator: Air Quality Goal 7 - To ensure access to affordable, reliable, sustainable and modern energy. Indicator: Access to affordable and clean energy services Goal 13 – Take urgent action to combat climate change and its impacts. Indicator: ICS Quality
Data / Parameter:	$U_{(i,j)}$
Unit:	Fraction
Description:	The fraction by which emission reductions are multiplied to obtain an adjustment for drop off of ICS in use per cohort year. A cohort is defined as the ICS model sold or gone through maintenance in the same year.
Source of data:	Survey of ICS users per cohort using sampling methods.
Value(s) applied	[XXX]
Measurement methods and procedures:	The SO keeps a paper and electronic record and a survey is done at least biennially in order to assess the ICS in operation. This factor addresses the leakage to be considered as per AMS II.G./Version 03 clause 14 if equipment currently being utilised is transferred from outside the boundary to the project activity.
Monitoring frequency:	Annual or biennial
QA/QC procedures:	Usage monitoring will be performed by the CME and/or by an authorised organisation designated by the CME following the sampling plan. In all cases cross-checking procedures appropriate to the monitoring choice will be undertaken.
Purpose of data	Calculation of leakage emissions
Additional comment:	

Relevant SDG Indicator	Goal 3 - To ensure healthy lives and promote well being for all at all ages. Indicator: Air Quality Goal 7 - To ensure access to affordable, reliable, sustainable and modern energy. Indicator: Access to affordable and clean energy services Goal 13 – Take urgent action to combat climate change and its impacts. Indicator: ICS Quality
Data / Parameter:	$Q_{Renewable\ Biomass,y}$
Unit:	Tonnes/Stove/year
Description:	Quantity of renewable biomass used in project ICS
Source of data:	Survey of ICS users per cohort using sampling methods.
Value(s) applied	[XXX]
Measurement methods and procedures:	Survey. The SO keeps a paper and electronic record.
Monitoring frequency:	Annual
QA/QC procedures:	Survey follows sampling guidelines
Purpose of data	Calculation of baseline emissions
Additional comment:	The survey will identify the share of days or cooking events where RB was used for cooking in the monitoring period.

B.7.2. Sampling plan

>> (If data and parameters monitored in section B.7.1 above are to be determined by a sampling approach, provide a description of the sampling plan.)

SAMPLING PLAN[28]: For Drop Off Check

Any one of the following two approaches may be used based on an analysis of the estimated monitoring costs and benefits associated with each approach-monitoring costs for the 2 approaches are expected to vary depending on the geographical coverage of the CPA and the comprehensiveness of the CPA's existing monitoring/tracking system. The census approach also allows ease of substitution for ICS that are proven to have dropped out:

[28] According to appendix 3 of the Standard for Sampling and Surveys for CDM Project Activities and Programme of Activities (Version 02.0), EB 65 Report, Annex 2; equations were obtained from "Best Practices Examples Focusing on Sample Size and Reliability Calculations", EB 67 Annex 6

Approach 1: Census

A census of all ICS in use obtained through the monitoring of records in the CPA's database. The database will be continually updated with the following events:

(a) an annual maintenance/repair event

(b) customer inspections resulting from loan or hire purchase agreements

(c) double verified records of community-based stove monitoring staff

(d) independent monitoring verification exercises organised by the CME.

Approach 2: Sampling

Sampling design

Since this is a multi-country POA, the CPAs admitted to the POA may choose in advance a suitable sampling plan from one of the following 4 options based on the estimated monitoring costs associated with each option-monitoring costs for the 4 options are expected to vary depending on the geographical coverage of the CPA and the CPA's existing monitoring/tracking system in addition to the envisaged risks and benefits of each option:

OPTION 1: Annual inspection per CPA[29]

Objectives and reliability requirements

The objective is to estimate the proportion of project improved cook stoves (ICS) that are still in operation/use at the end of each year. AMS II.G./Version 03 will be applied. The overall objective is to estimate the annual emission reductions during the year y in tCO_2e during the crediting period, and with 90/10 confidence/precision.

Target population

The target population is the total number of ICS installed by the CPA at the end of the year. The primary means to uniquely identify the activities under the CPA is by means of buyer information collected through Sales Agreements and the unique numbering of each ICS. The sales data will be stored in the CPA's records in the PoA's electronic database.

The data to be collected on each sampling unit (ICS) is whether it is in use or not.

Sampling method

Simple random sampling will be used. A number of ICS will be sampled using simple random sampling with the aid of a computerised randomiser. The PoA database of stove and user information established through the Sales Agreements and subsequently updated on a continuous basis will be used as the sampling frame.

Sample size

The required sample size will be determined using simple random sampling.

The equation for estimating the sample size is:

[29] This implies either conducting a census or selecting a random sample for each CPA independently according to the sampling plan

$$n \geq \frac{1.645^2 NV}{(N-1)X0.1^2 + 1.645^2 V}$$

Where $V = \frac{p(1-p)}{p^2}$ and p is the expected proportion

n Sample size
N Population total
p Our expected proportion
1.645 Represents the 90% confidence required
0.1 Represents the 10% relative precision

The minimum sample sizes for the different scenarios required to meet the confidence and precision requirements are calculated in a sample size computation spreadsheet.[30]

Summary results for different populations are found in the following table for an assumed 50% of cook stoves still in use[31]:

Population size	Calculated minimum sample size	Adjusted sample size according to response rate of 80%
1,000	214	268
2,000	239	299
3,000	249	312
4,000	254	318
5,000	257	322
6,000	259	324
7,000	261	327
8,000	262	328
9,000	263	329
10,000	264	330
11,000	265	332
12,000	265	332
13,250	266	333

[30] Sample size calculation spreadsheet provided to the DOE

[31] The percentage of cook stoves expected in use will be altered for each CPA depending on their performance

14,000	266	333

Sampling frame

The PoA database of stove and user information established through the Sales Agreements and subsequently updated on a continuous basis will be used as the sampling frame.

OPTION 2: Annual inspection of a random sample of CPAs from each Supplier Organisation (SO)

Objectives and reliability requirements

The objective is to estimate the proportion of project improved cook stoves (ICS) that are still in operation/use at the end of each year. AMS II.G./Version 03 will be applied. The overall objective is to estimate the annual emission reductions during the year y in tCO_2e during the crediting period, and with 95/10 confidence/precision.

Target population

The target population is the total number of ICS installed by the CPAs classified by Supplier Organisation at the end of the year. The primary means to uniquely identify the activities under the CPA is by means of buyer information collected through Sales Agreements and the unique numbering of each ICS. The sales data will be stored in the CPA's records in the PoA's electronic database.

The data to be collected on each sampling unit (ICS) is whether it is in use or not.

Sampling method

Multistage sampling will be used. A number of ICS within the selected CPAs belonging to each Supplier organisation will be sampled using simple random sampling with the aid of a computerised randomiser. The PoA database of stove and user information established through the Sales Agreements and subsequently updated on a continuous basis will be used as the sampling frame.

Sample Size

The required sample size will be determined using multistage sampling.

The equation for the number of clusters (CPAs) to be sampled is:

$$C \geq \frac{\frac{SD_B^2}{\overline{P^2}} X \frac{M}{M-1} + \frac{1}{\bar{u}} X \frac{SD_W^2}{\overline{P^2}} X \frac{(\overline{N}\text{-}\bar{u})}{(\overline{N}-1)}}{\frac{0.1^2}{1.96^2} + \frac{1}{M-1}\frac{SD_B^2}{\overline{P^2}}}$$

Where:

C Number of groups/clusters/CPAs that should be sampled
M The total number of clusters (CPAs) in the population
$\bar{u}$ Number of (ICS/households) to be sampled within each cluster (CPA)
$\overline{N}$ Average units (ICS/households) per cluster (CPA)
SD_B^2 Variance between clusters (CPA)
SD_W^2 Average within cluster (CPA) variation

p Overall proportion of ICS in use
1.96 Represents the 95% confidence required
0.1 Represents the 10% relative precision
$\bar{p}$ Is the average proportion of ICS

The minimum sample sizes -for the different scenarios- required to meet the confidence and precision requirements are given in a computation spreadsheet [32].

Summary results for different possible numbers of CPAs are found in the following table for an assumed 80% of cook stoves in use: [33]

Number of ICS to be sampled from each CPA	Number of CPAs to Sample	Total sample size
1	96	96
5	21	105
10	11	110
15	8	120
20	6	120
25	6	150
30	5	150
35	4	140
40	4	160

Sampling frame

The PoA database of stove and user information and their corresponding CPAs classified by Supplier Organisation established through the Sales Agreements and subsequently updated on a continuous basis will be used as the sampling frame. Supplier Organisation by CPA will classify the stoves in the PoA database for sampling purposes.

OPTION 3: Biennial inspection per CPA

Objectives and reliability requirements

The objective is to estimate the proportion of project improved cook stoves (ICS) that are still in operation/use at the end of each year. AMS II.G./Version 03 will be applied. The overall objective is to estimate the annual emission reductions during the year y in tCO_2e during the crediting period, and with 95/5 confidence/precision.

[32] Provided to the DOE

[33] The percentage of cook stoves expected in use will be altered for each CPA depending on their performance

Target population

The target population is the total number of ICS installed by the CPA at the end of the year. The primary means to uniquely identify the activities under the CPA is by means of buyer information collected through Sales Agreements and the unique numbering of each ICS. The sales data will be stored in the CPA's records in the PoA's electronic database.

The data to be collected on each sampling unit (ICS) is whether it is in use or not.

Sampling method

Simple random sampling will be used. A number of ICS will be sampled using simple random sampling with the aid of a computerised randomiser. The PoA database of stove and user information established through the Sales Agreements and subsequently updated on a continuous basis will be used as the sampling frame.

Sample size

The required sample size will be determined using simple random sampling.

The equation for estimating the sample size is:

$$n \geq \frac{1.96^2 NV}{(N-1)X0.05^2 + 1.96^2 V}$$

Where $V = \frac{p(1-p)}{p^2}$ and p is the expected proportion

n	Sample size
N	Population total
p	Our expected proportion
1.96	Represents the 95% confidence required
0.05	Represents the 5% relative precision

The minimum sample sizes-for the different scenarios-required to the meet the confidence and precision requirements are calculated in a computation spreadsheet[34].

Summary results for different populations are found in the following table for an assumed 50% of cook stoves still in use[35]:

Population size	Calculated minimum sample size	Adjusted sample size according to response rate of 80%
1,000	607	759
2,000	870	1088

[34] Sample size calculation spreadsheet provided to the DOE

[35] The percentage of cook stoves expected in use will be altered for each CPA depending on their performance

3,000	1017	1272
4,000	1111	1389
5,000	1176	1470
6,000	1224	1530
7,000	1261	1577
8,000	1290	1613
9,000	1313	1642
10,000	1333	1667
11,000	1349	1687
12,000	1363	1704
13,250	1378	1723
14,000	1385	1732

Sampling frame

The PoA database of stove and user information established through the Sales Agreements and subsequently updated on a continuous basis will be used as the sampling frame.

OPTION 4: Annual inspection of a random sample of CPAs from CPAs using the same ICS Model

Objectives and reliability requirements

The objective is to estimate the proportion of project improved cook stoves (ICS) that are still in operation/use at the end of each year. AMS II.G./Version 03 will be applied. The overall objective is to estimate the annual emission reductions during the year y in tCO_2e during the crediting period, and with 95/10 confidence/precision.

Target population

The target population is the total number of ICS installed by the CPAs classified by Stove Model at the end of the year. The primary means to uniquely identify the activities under the CPA is by means of buyer information collected through Sales Agreements and the unique numbering of each ICS. The sales data will be stored in the CPA's records in the PoA's electronic database.

The data to be collected on each sampling unit (ICS) is whether it is in use or not.

Sampling method

Multistage sampling will be used. A number of ICS within the selected CPAs deploying the same stove model will be sampled using simple random sampling with the aid of a computerised randomiser. The PoA database of stove and user information established through the Sales

Agreements and subsequently updated on a continuous basis will be used as the sampling frame.

Sample size

The required sample size will be determined using multistage sampling.

The equation for the number of clusters (CPAs) to be sampled is:

$$C \geq \frac{\frac{SD_B^2}{\overline{P^2}} X \frac{M}{M-1} + \frac{1}{\overline{u}} X \frac{SD_W^2}{\overline{P^2}} X \frac{(\overline{N}\text{-}\overline{u})}{(\overline{N}-1)}}{\frac{0.1^2}{1.96^2} + \frac{1}{M-1}\frac{SD_B^2}{\overline{P^2}}}$$

Where:

C	Number of groups/clusters/CPAs that should be sampled
M	The total number of clusters (CPAs) in the population
$\bar{u}$	Number of (ICS/households) to be sampled within each cluster (CPA)
$\bar{N}$	Average units (ICS/households) per cluster (CPA)
SD_B^2	Variance between clusters (CPA)
SD_W^2	Average within cluster (CPA) variation
p	Overall proportion of ICS in use
1.96	Represents the 95% confidence required
0.1	Represents the 10% relative precision
$\bar{p}$	Is the average proportion of ICS

The minimum sample sizes -for the different scenarios- required to meet the confidence and precision requirements are given in a computation spreadsheet [36].

Summary results for different possible numbers of CPAs are found in the following table for an assumed 80% of cook stoves in use: [37]

Number of ICS to be sampled from each CPA	Number of CPAs to Sample	Total sample size
1	96	96
5	21	105
10	11	110
15	8	120
20	6	120
25	6	150

[36] Provided to the DOE

[37] The percentage of cook stoves expected in use will be altered for each CPA depending on their performance

30	5	150
35	4	140
40	4	160

Sampling frame

The PoA database of stove and user information and their corresponding CPAs classified by Supplier Organisation established through the Sales Agreements and subsequently updated on a continuous basis will be used as the sampling frame. Stove Model by CPA will classify the stoves in the PoA database for sampling purposes.

Data

Field measurements

The main variable that will be measured by the usage survey is the proportion of ICS in use. Monitoring surveys will be conducted to determine and validate the proportion of ICS in use.

Quality assurance/quality control

A team of research assistants and supervisors for the usage survey will be recruited and trained in all aspects of sampling, data collection and interviewing by the CME or a CME-appointed agent. The training will involve both theoretical and practical aspects to ensure that all the research assistants are competent to collect the desired data. Data collection protocols will be prepared and given to the research assistants and supervisors to guide them during the data collection exercise. In addition, there will be a supervisor from the CME head office. Mobile devices, for instance mobile phones and other devices, will be used to electronically send data to the central database at the CME head office. The updating of the PoA's central database will be strictly monitored with several permission levels and passwords. In cases where the use of mobile devices is impossible, paper copies of questionnaires will be used to collect data about the usage of ICS from the selected sample.

The data collection protocols prepared for the research assistants will include the procedures for handling cases of non-response (refusals, not-at-home, out-of-population cases and related cases). A variable will be included to capture the results of interviews with the following 4 options: responded, out-of-population, refused, not-at-home. The protocols will also include the roles and responsibilities of the research assistants and supervisor. In addition, the definition of each of the study variables, mode of data collection and recording will be highlighted in the data collection protocol.

In case of non-response as a result of respondents not being at home, there will be at least 3 call backs. Oversampling will also be undertaken to take care of non-response.

In addition, supplier organisations will be trained in all aspects of data collection and recording, especially using mobile devices and other relevant technologies, for the continuous updating and monitoring of data in the PoA's central database.

Since the main parameter in the usage survey is the proportion of ICS in use, no outlier

data/measurements are expected. However, check programmes will be prepared to automatically reject data that is defective and will automatically notify the research assistant that the data is defective for immediate verification, rectification or callback.

Analysis

The data obtained from the selected households owning the ICS will be further cleaned and validated for accuracy and analysed by the CME's Monitoring Manager. All the sales data and the usage survey data will be captured in a computerised database. The analysis will include computation of the proportion of ICS in use, frequencies of the other study variables and the computation of variables necessary for the estimation of emission reductions according to AMS II.G/Version 03. The results will be summarised using the pre-specified level of confidence. The precision of the estimates (proportion of ICS in use) will be checked to ensure that the estimate is within the pre-specified reliability precision. Computing and evaluating the standard error of the proportion to establish whether it is within the permissible limits will check the reliability of the estimates.

Implementation

Implementation Plan

The Monitoring Manager will be responsible for data collection and data analysis. The Monitoring Manager has experience in sampling and surveys.

The schedule for implementing the sampling will be set out by the Monitoring Manager.

SAMPLING PLAN:[38]: For Efficiency Check

Sampling design

Since this is a multi-country POA, the CPAs admitted to the POA may choose in advance a suitable sampling plan from one of the following 4 options based on the estimated monitoring costs associated with each option-monitoring costs for the 4 options are expected to vary depending on the geographical coverage of the CPA and the CPA's existing monitoring/tracking system in addition to the envisaged risks and benefits of each option:

OPTION 1: Annual inspection per CPA

Objectives and reliability requirements

The objective is to estimate the mean thermal efficiency of the project improved cook stoves (ICS) with 90/10 confidence/precision.

Target population

The target population is the total number of ICS installed by the CPA at the end of the year that are in use. The primary means to uniquely identify the activities under the CPA is by means of buyer information collected through Sales Agreements and the unique numbering of each ICS.

[38] According to appendix 3 of the Standard for Sampling and Surveys for CDM Project Activities and Programme of Activities (Version 02.0), EB 65 Report, Annex 2; equations were obtained from "Best Practices Examples Focusing on Sample Size and Reliability Calculations", EB 67 Annex 6

The sales data will be stored in the CPA's records in the PoA's electronic database. The total number of cook stoves that are in use will be identified through either one or a combination of the following activities that will be stored in the monitoring database: The database will be continually updated with the following events: (a) an annual maintenance/repair event (b) customer inspections resulting from loan or hire purchase agreements (c) double verified records of community-based stove monitoring staff (d) independent monitoring verification exercises organised by the CME (e) annual usage survey.

The data to be collected on each sampling unit (ICS) is its thermal efficiency.

Sampling method

Simple random sampling will be used. A number of ICS in each cohort will be sampled using simple random sampling with the aid of a computerised randomiser. The PoA database of stove and user information established through the Sales Agreements and subsequently updated on a continuous basis will be used to identify ICS in use that will be used as the sampling frame. The database will be continually updated with the following events: (a) an annual maintenance/repair event (b) customer inspections resulting from loan or hire purchase agreements (c) double verified records of community-based stove monitoring staff (d) independent monitoring verification exercises organised by the CME (e) annual usage survey.

Sample size

The required sample size will be determined using simple random sampling in each cohort.

The equation for estimating the sample size in each cohort is:

$$n \geq \frac{1.645^2 NV}{(N-1)X0.1^2+1.645^2 V}$$

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

n	sample size
N	Total number of ICS in use
Mean	Our expected standard deviation
1.645	Represents the 90% confidence required
0.1	Represents the 10% relative precision

The minimum sample sizes -for the different scenarios- required to meet the confidence and precision requirements are given in a computation spreadsheet.[39]

Summary results for different populations are found in the following table for an assumed 0.285 mean efficiency[40]:

Population size	Standard deviation	Calculated minimum sample size	Adjusted sample size according to response rate of 80%

[39] Sample size calculation spreadsheet provided to the DOE

[40] The percentage of cook stoves expected in use will be altered for each CPA depending on their performance

1,000	0.175	93	117
2,000	0.175	98	123
3,000	0.175	99	124
4,000	0.175	100	125
5,000	0.175	101	127
6,000	0.175	101	127
7,000	0.175	101	127
8,000	0.175	101	127
9,000	0.175	101	127
10,000	0.175	102	128
11,000	0.175	102	128
12,000	0.175	102	128
13,250	0.175	102	128
14,000	0.175	102	128

Sampling frame

The PoA database of stove and user information established through the Sales Agreements and subsequently updated on a continuous basis will be used to identify ICS in use that will be used as the sampling frame. The database will be continually updated with the following events: (a) an annual maintenance/repair event (b) customer inspections resulting from loan or hire purchase agreements (c) double verified records of community-based stove monitoring staff (d) independent monitoring verification exercises organised by the CME (e) annual usage survey.

OPTION 2: Annual inspection of a random sample of CPAs from each Supplier Organization (SO)

Objectives and reliability requirements

The objective is to estimate the mean thermal efficiency of the project improved cook stoves (ICS) with 95/10 confidence/precision.

Target population

The target population is the total number of ICS installed by the CPA at the end of the year that are in use classified by Supplier Organisation. The primary means to uniquely identify the activities under the CPA is by means of buyer information collected through Sales Agreements and the unique numbering of each ICS. The sales data will be stored in the CPA's records in the PoA's electronic database. The total number of cook stoves that are in use will be identified through

either one or a combination of the following activities that will be stored in the monitoring database: The database will be continually updated with the following events: (a) an annual maintenance/repair event (b) customer inspections resulting from loan or hire purchase agreements (c) double verified records of community-based stove monitoring staff (d) independent monitoring verification exercises organised by the CME (e) annual usage survey.

The data to be collected on each sampling unit (ICS) is its thermal efficiency.

Sampling method

Multistage sampling will be used. A number of ICS in each cohort within the selected CPAs belonging to each Supplier organization will be sampled using simple random sampling with the aid of a computerised randomiser. The PoA database of stove and user information established through the Sales Agreements and subsequently updated on a continuous basis will be used to identify ICS in use that will be used as the sampling frame. The database will be continually updated with the following events: (a) an annual maintenance/repair event (b) customer inspections resulting from loan or hire purchase agreements (c) double verified records of community-based stove monitoring staff (d) independent monitoring verification exercises organised by the CME (e) annual usage survey.

Sample size

The required sample size will be determined using multistage sampling.

The equation for the number of clusters (CPAs) to be sampled is:

$$C \geq \frac{\frac{SD_B^2}{clustermean^2} X \frac{M}{M-1} + \frac{1}{\bar{u}} X \frac{SD_W^2}{overallmean^2} X \frac{(\bar{N}\text{-}\bar{u})}{(\bar{N}-1)}}{\frac{0.1^2}{1.96^2} + \frac{1}{M-1}\frac{SD_B^2}{clustermean^2}}$$

Where:

C	Number of groups/clusters/CPAs that should be sampled
M	The total number of clusters (CPAs) in the population
$\bar{u}$	Number of (ICS/households) to be sampled within each cluster (CPA)
$\bar{N}$	Average units (ICS/households) per cluster (CPA)
SD_B^2	Variance between clusters (CPA)
SD_W^2	Average within cluster (CPA) variation
1.96	Represents the 95% confidence required
0.1	Represents the 10% relative precision

The minimum sample sizes -for the different scenarios- required to meet the confidence and precision requirements are given in a computation spreadsheet.[41]

Summary results for different possible numbers of CPA are found in the following table for an assumed efficiency of 0.28[42]:

[41] Sample size calculation spreadsheet provided to the DOE

[42] The percentage of cook stoves expected in use will be altered for each CPA depending on their performance

Number of ICS to be sampled from each CPA	Number of CPAs to Sample	Total sample size
1	87	87
5	20	100
10	12	120
15	9	135
20	8	160
25	7	175
30	6	180
35	6	210
40	6	240

Sampling frame

The PoA database of stove and user information established through the Sales Agreements and subsequently updated on a continuous basis will be used to identify ICS in use that will be used as the sampling frame. The database will be continually updated with the following events: (a) an annual maintenance/repair event (b) customer inspections resulting from loan or hire purchase agreements (c) double verified records of community-based stove monitoring staff (d) independent monitoring verification exercises organised by the CME (e) annual usage survey. Supplier Organization by CPA will classify the stoves in the PoA database for sampling purposes.

OPTION 3: Biennial inspection per CPA

Objectives and reliability requirements

The objective is to estimate the mean thermal efficiency of the project improved cook stoves (ICS) with 95/5 confidence/precision.

Target population

The target population is the total number of ICS installed by the CPA at the end of the year that are in use. The primary means to uniquely identify the activities under the CPA is by means of buyer information collected through Sales Agreements and the unique numbering of each ICS. The sales data will be stored in the CPA's records in the PoA's electronic database. The total number of cook stoves that are in use will be identified through either one or a combination of the following activities that will be stored in the monitoring database: The database will be continually updated with the following events: (a) an annual maintenance/repair event (b) customer inspections resulting from loan or hire purchase agreements (c) double verified records of community-based stove monitoring staff (d) independent monitoring verification exercises organised by the CME (e) annual usage survey.

The data to be collected on each sampling unit (ICS) is its thermal efficiency.

Sampling method

Simple random sampling will be used. A number of ICS in each cohort will be sampled using simple random sampling with the aid of a computerised randomiser. The PoA database of stove and user information established through the Sales Agreements and subsequently updated on a continuous basis will be used to identify ICS in use that will be used as the sampling frame. The database will be continually updated with the following events: (a) an annual maintenance/repair event (b) customer inspections resulting from loan or hire purchase agreements (c) double verified records of community-based stove monitoring staff (d) independent monitoring verification exercises organised by the CME (e) annual usage survey.

Sample size

The required sample size will be determined using simple random sampling in each cohort.

The equation for estimating the sample size in each cohort is:

$$n \geq \frac{1.96^2 NV}{(N-1)X0.05^2+1.96^2 V}$$

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

n	sample size
N	Total number of ICS in use
Mean	Our expected standard deviation
1.96	Represents the 95% confidence required
0.05	Represents the 5% relative precision

The minimum sample sizes -for the different scenarios- required to meet the confidence and precision requirements are given in a computation spreadsheet. [43]

Summary results for different populations are found in the following table for an assumed 0.285 mean efficiency[44]:

Population size	Standard deviation	Calculated minimum sample size	Adjusted sample size according to response rate of 80%
1,000	0.175	368	460
2,000	0.175	450	563
3,000	0.175	486	608
4,000	0.175	507	634

[43] Sample size calculation spreadsheet provided to the DOE

[44] The percentage of cook stoves expected in use will be altered for each CPA depending on their performance

5,000	0.175	520	650
6,000	0.175	529	662
7,000	0.175	536	670
8,000	0.175	541	677
9,000	0.175	545	682
10,000	0.175	548	685
11,000	0.175	551	689
12,000	0.175	553	692
13,250	0.175	556	695
14,000	0.175	557	697

Sampling frame

The PoA database of stove and user information established through the Sales Agreements and subsequently updated on a continuous basis will be used to identify ICS in use that will be used as the sampling frame. The database will be continually updated with the following events: (a) an annual maintenance/repair event (b) customer inspections resulting from loan or hire purchase agreements (c) double verified records of community-based stove monitoring staff (d) independent monitoring verification exercises organised by the CME (e) annual usage survey.

OPTION 4: Annual inspection of a random sample of CPAs from CPAs using the same ICS Model

Objectives and reliability requirements

The objective is to estimate the mean thermal efficiency of the project improved cook stoves (ICS) with 95/10 confidence/precision.

Target population

The target population is the total number of ICS installed by the CPA at the end of the year that are in use. The primary means to uniquely identify the activities under the CPA is by means of buyer information collected through Sales Agreements and the unique numbering of each ICS. The sales data will be stored in the CPA's records in the PoA's electronic database. The total number of cook stoves that are in use will be identified through either one or a combination of the following activities that will be stored in the monitoring database: The database will be continually updated with the following events: (a) an annual maintenance/repair event (b) customer inspections resulting from loan or hire purchase agreements (c) double verified records of community-based stove monitoring staff (d) independent monitoring verification exercises organised by the CME (e) annual usage survey.

The data to be collected on each sampling unit (ICS) is its thermal efficiency.

Sampling method

Multistage sampling will be used. A number of ICS in each cohort within the selected CPAs operating the same Stove Model will be sampled using simple random sampling with the aid of a computerised randomiser. The PoA database of stove and user information established through the Sales Agreements and subsequently updated on a continuous basis will be used to identify ICS in use that will be used as the sampling frame. The database will be continually updated with the following events: (a) an annual maintenance/repair event (b) customer inspections resulting from loan or hire purchase agreements (c) double verified records of community-based stove monitoring staff (d) independent monitoring verification exercises organised by the CME (e) annual usage survey.

Sample size

The required sample size will be determined using multistage sampling.

The equation for the number of clusters (CPAs) to be sampled is:

$$C \geq \frac{\frac{SD_B^2}{clustermean^2} X \frac{M}{M-1} + \frac{1}{\bar{u}} X \frac{SD_W^2}{overallmean^2} X \frac{(\bar{N}\text{-}\bar{u})}{(\bar{N}-1)}}{\frac{0.1^2}{1.96^2} + \frac{1}{M-1}\frac{SD_B^2}{clustermean^2}}$$

Where:

C	Number of groups/clusters/CPAs that should be sampled
M	The total number of clusters (CPAs) in the population
$\bar{u}$	Number of (ICS/households) to be sampled within each cluster (CPA)
$\bar{N}$	Average units (ICS/households) per cluster (CPA)
SD_B^2	Variance between clusters (CPA)
SD_W^2	Average within cluster (CPA) variation
1.96	Represents the 95% confidence required
0.1	Represents the 10% relative precision

The minimum sample sizes -for the different scenarios- required to meet the confidence and precision requirements are given in a computation spreadsheet.[45]

Summary results for different possible numbers of CPA are found in the following table for an assumed efficiency of 0.28[46]:

Number of ICS to be sampled from each CPA	Number of CPAs to Sample	Total sample size
1	87	87
5	20	100
10	12	120

[45] Sample size calculation spreadsheet provided to the DOE

[46] The percentage of cook stoves expected in use will be altered for each CPA depending on their performance

15	9	135
20	8	160
25	7	175
30	6	180
35	6	210
40	6	240

Sampling frame

The PoA database of stove and user information established through the Sales Agreements and subsequently updated on a continuous basis will be used to identify ICS in use that will be used as the sampling frame. The database will be continually updated with the following events: (a) an annual maintenance/repair event (b) customer inspections resulting from loan or hire purchase agreements (c) double verified records of community-based stove monitoring staff (d) independent monitoring verification exercises organised by the CME (e) annual usage survey. Stove Model by CPA will classify the stoves in the PoA database for sampling purposes.

Data

Field measurements

The main variable that will be measured by the efficiency survey is the efficiency rating of ICS in use.

Quality assurance/quality control

A team of research assistants and supervisors for the usage survey will be recruited and trained in all aspects of sampling, data collection and interviewing by the CME or a CME-appointed agent. The training will involve both theoretical and practical aspects to ensure that all the research assistants are competent to collect the desired data. Data collection protocols will be prepared and given to the research assistants and supervisors to guide them during the data collection exercise. In addition, there will be a supervisor from the CME head office. Mobile devices, for instance mobile phones and other devices, will be used to electronically send data to the central database at the CME head office. The updating of the PoA's central database will be strictly monitored with several permission levels and passwords. In cases where the use of mobile devices is impossible, paper copies of questionnaires will be used to collect data about the usage of ICS from the selected sample.

The data collection protocols prepared for the research assistants will include the procedures for handling cases of non-response (refusals, not-at-home, out-of-population cases and related cases). A variable will be included to capture the results of interviews with the following 4 options: responded, out-of-population, refused, not-at-home. The protocols will also include the roles and responsibilities of the research assistants and supervisor. In addition, the definition of each of the study variables, mode of data collection and recording will be highlighted in the data collection protocol.

In case of non-response as a result of respondents not being at home, there will be at least 3 call backs. Oversampling will also be undertaken to take care of non-response.

In addition, supplier organisations will be trained in all aspects of data collection and recording, especially using mobile devices and other relevant technologies, for the continuous updating and monitoring of data in the PoA's central database.

Since the main parameter in the thermal efficiency of the ICS, limits for outlier data/measurements will be present. Check programs will also be prepared to automatically reject defective data and automatically notify the testers that the data is defective for immediate verification and rectification or call back.

Analysis

The data obtained from the selected households owning the ICS will be further cleaned and validated for accuracy and analysed by the CME's Monitoring Manager. All efficiency rating survey data will be captured in a computerised database. The analysis will include computation of the thermal efficiency of ICS in use. The results will be summarized using the pre-specified level of confidence. The precision of the estimates (thermal efficiency of ICS in use) will be checked to ensure that the estimate is within the pre-specified reliability precision. Computing and evaluating the standard error of the mean thermal efficiency to establish whether it is within the permissible limits will check the reliability of the estimates.

Implementation

Implementation Plan

The Monitoring Manager will be responsible for data collection and data analysis. The Monitoring Manager has experience in sampling and surveys.

The schedule for implementing the sampling will be set out by the Monitoring Manager.

SAMPLING PLAN: For Determination of Historical Annual Average Consumption of Woody Biomass per Appliance (tonnes/year)

The "Quantity of woody biomass that is substituted or displaced" can be either determined as the share of days or cooking events where renewable biomass was used as fuel or based on the parameter $HG_{p,y}$ "Quantity of thermal energy generated" as per the provisions of AMS-I.I.

In the following, it is assumed the "Quantity of woody biomass that is substituted or displaced" is determined by a survey to find out the share of days or cooking events where renewable biomass was used as fuel. Although, the parameter of interest is expressed in percentages, the parameter of interest is of the type "mean".

Sampling design

Since this is a multi-country POA, the CPAs admitted to the PoA may choose in advance a suitable sampling plan from one of the following 4 options based on the estimated monitoring costs

associated with each option-monitoring costs for the 4 options are expected to vary depending on the geographical coverage of the CPA and the CPA's existing monitoring/tracking system in addition to the envisaged risks and benefits of each option:

OPTION 1: ANNUAL INSPECTION PER CPA

Objectives and reliability requirements

The objective is to estimate the share of days or cooking events where renewable biomass was used as fuel of the project improved cook stoves (ICS) with 90/10 confidence/precision (in the following the "*share of RB use*").

Target population

The target population is the total number of ICS installed by the CPA at the end of the year that are in use. The primary means to uniquely identify the activities under the CPA is by means of buyer information collected through Sales Agreements and the unique numbering of each ICS. The sales data will be stored in the CPA's records in the PoA's electronic database. The total number of cook stoves that are in use will be identified through either one or a combination of the following activities that will be stored in the monitoring database: The database will be continually updated with the following events: (a) an annual maintenance/repair event (b) customer inspections resulting from loan or hire purchase agreements (c) double verified records of community-based stove monitoring staff (d) independent monitoring verification exercises organised by the CME (e) annual usage survey.

The data to be collected on each sampling unit (ICS) is its share of RB use.

Sampling method

Simple random sampling will be used. A number of ICS in each cohort will be sampled using simple random sampling with the aid of a computerised randomiser. The PoA database of stove and user information established through the Sales Agreements and subsequently updated on a continuous basis will be used to identify ICS in use that will be used as the sampling frame. The database will be continually updated with the following events: (a) an annual maintenance/repair event (b) customer inspections resulting from loan or hire purchase agreements (c) double verified records of community-based stove monitoring staff (d) independent monitoring verification exercises organised by the CME (e) annual usage survey.

Sample size

The required sample size will be determined using simple random sampling in each cohort.

The equation for estimating the sample size in each cohort is:

$$n \geq \frac{1.645^2 NV}{(N-1)X0.1^2+1.645^2 V}$$

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

n sample size

N Total number of ICS in use

Mean Our expected standard deviation

1.645 Represents the 90% confidence required

0.1 Represents the 10% relative precision

The minimum sample sizes -for the different scenarios- required to meet the confidence and precision requirements are given in a computation spreadsheet. [47]

Summary results for different expected shares of RB use are found in the following table for an assumed population total (N) of 12,849:

Our expected share	Standard deviation	Sample size	Adjusted sample size according to response rate of 80%
0.9	0.02	1	2
0.8	0.04	1	2
0.7	0.06	2	3
0.6	0.08	5	7
0.5	0.1	11	14
0.4	0.12	25	31
0.3	0.14	59	74
0.2	0.16	171	214
0.1	0.18	821	1,027

Sampling frame

The PoA database of stove and user information established through the Sales Agreements and subsequently updated on a continuous basis will be used to identify ICS in use that will be used as the sampling frame. The database will be continually updated with the following events: (a) an annual maintenance/repair event (b) customer inspections resulting from loan or hire purchase

[47] Sample size calculation spreadsheet provided to the DOE

agreements (c) double verified records of community-based stove monitoring staff (d) independent monitoring verification exercises organised by the CME (e) annual usage survey.

OPTION 2: ANNUAL INSPECTION OF A RANDOM SAMPLE OF CPAS FROM EACH SUPPLIER ORGANISATION (SO)

Objectives and reliability requirements

The objective is to estimate the share of days or cooking events where renewable biomass was used as fuel of the project improved cook stoves (ICS) with 95/10 confidence/precision (in the following the "*share of RB use*").

Target population

The target population is the total number of ICS installed by the CPA at the end of the year that are in use classified by Supplier Organisation. The primary means to uniquely identify the activities under the CPA is by means of buyer information collected through Sales Agreements and the unique numbering of each ICS. The sales data will be stored in the CPA's records in the PoA's electronic database. The total number of cook stoves that are in use will be identified through either one or a combination of the following activities that will be stored in the monitoring database: The database will be continually updated with the following events: (a) an annual maintenance/repair event (b) customer inspections resulting from loan or hire purchase agreements (c) double verified records of community-based stove monitoring staff (d) independent monitoring verification exercises organised by the CME (e) annual usage survey.

The data to be collected on each sampling unit (ICS) is the share of RB use.

Sampling method

Multistage sampling will be used. A number of ICS in each cohort within the selected CPAs belonging to each Supplier organisation will be sampled using simple random sampling with the aid of a computerised randomiser. The PoA database of stove and user information established through the Sales Agreements and subsequently updated on a continuous basis will be used to identify ICS in use that will be used as the sampling frame. The database will be continually updated with the following events: (a) an annual maintenance/repair event (b) customer inspections resulting from loan or hire purchase agreements (c) double verified records of community-based stove monitoring staff (d) independent monitoring verification exercises organised by the CME (e) annual usage survey.

Sample size

The required sample size will be determined using multistage sampling.

The equation for the number of clusters (CPAs) to be sampled is:

$$C \geq \frac{\frac{SD_B^2}{clustermean^2} X \frac{M}{M-1} + \frac{1}{\bar{u}} X \frac{SD_W^2}{overallmean^2} X \frac{(\bar{N}-\bar{u})}{(\bar{N}-1)}}{\frac{0.1^2}{1.96^2} + \frac{1}{M-1} \frac{SD_B^2}{clustermean^2}}$$

Where:

C	Number of groups/clusters/CPAs that should be sampled
M	The total number of clusters (CPAs) in the population
$\bar{u}$	Number of (ICS/households) to be sampled within each cluster (CPA)
$\bar{N}$	Average units (ICS/households) per cluster (CPA)
SD_B^2	Variance between clusters (CPA)
SD_W^2	Average within cluster (CPA) variation
1.96	Represents the 95% confidence required
0.1	Represents the 10% relative precision

The minimum sample sizes -for the different scenarios- required to meet the confidence and precision requirements are given in a computation spreadsheet.

Summary results for different possible numbers of CPAs are found in the following table for an assumed share of RB use from 0.4 to 0.6:

Number of ICS to be sampled from each CPA	Adjusted Number of ICS to be sampled from each CPA	Total sample size of CPAs
10	13	444
50	63	96
100	125	53
150	188	38
200	250	31
250	313	27
300	375	24
400	500	20
500	625	18

Sampling frame

The PoA database of stove and user information established through the Sales Agreements and subsequently updated on a continuous basis will be used to identify ICS in use that will be used as the sampling frame. The database will be continually updated with the following events: (a) an annual maintenance/repair event (b) customer inspections resulting from loan or hire purchase agreements (c) double verified records of community-based stove monitoring staff (d)

independent monitoring verification exercises organised by the CME (e) annual usage survey. Supplier Organisation by CPA will classify the stoves in the PoA database for sampling purposes.

OPTION 3: BIENNIAL INSPECTION PER CPA

Objectives and reliability requirements

The objective is to estimate the share of days or cooking events where renewable biomass was used as fuel of the project improved cook stoves (ICS) with 95/5 confidence/precision (in the following the "*share of RB use*").

Target population

The target population is the total number of ICS installed by the CPA at the end of the year that are in use. The primary means to uniquely identify the activities under the CPA is by means of buyer information collected through Sales Agreements and the unique numbering of each ICS. The sales data will be stored in the CPA's records in the PoA's electronic database. The total number of cook stoves that are in use will be identified through either one or a combination of the following activities that will be stored in the monitoring database: The database will be continually updated with the following events: (a) an annual maintenance/repair event (b) customer inspections resulting from loan or hire purchase agreements (c) double verified records of community-based stove monitoring staff (d) independent monitoring verification exercises organised by the CME (e) annual usage survey.

The data to be collected on each sampling unit (ICS) is the share of RB use.

Sampling method

Simple random sampling will be used. A number of ICS in each cohort will be sampled using simple random sampling with the aid of a computerised randomiser. The PoA database of stove and user information established through the Sales Agreements and subsequently updated on a continuous basis will be used to identify ICS in use that will be used as the sampling frame. The database will be continually updated with the following events: (a) an annual maintenance/repair event (b) customer inspections resulting from loan or hire purchase agreements (c) double verified records of community-based stove monitoring staff (d) independent monitoring verification exercises organised by the CME (e) annual usage survey.

Sample size

The required sample size will be determined using simple random sampling in each cohort.

The equation for estimating the sample size in each cohort is:

$$n \geq \frac{1.96^2 NV}{(N-1)X0.05^2+1.96^2 V}$$

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

n sample size

N Total number of ICS in use

Mean Our expected standard deviation

1.96 Represents the 95% confidence required

0.05 Represents the 5% relative precision

The minimum sample sizes -for the different scenarios- required to meet the confidence and precision requirements are given in a computation spreadsheet.

Summary results for different expected shares of RB use are found in the following table for an assumed population total (N) of 12,849:

Our expected share	Standard deviation	Sample size	Adjusted sample size according to response rate of 80%
0.9	0.02	1	2
0.8	0.04	4	5
0.7	0.06	12	15
0.6	0.08	28	35
0.5	0.1	62	77
0.4	0.12	137	172
0.3	0.14	327	408
0.2	0.16	914	1,142
0.1	0.18	3,589	4,486

Sampling frame

The PoA database of stove and user information established through the Sales Agreements and subsequently updated on a continuous basis will be used to identify ICS in use that will be used as the sampling frame. The database will be continually updated with the following events: (a) an annual maintenance/repair event (b) customer inspections resulting from loan or hire purchase agreements (c) double verified records of community-based stove monitoring staff (d) independent monitoring verification exercises organised by the CME (e) annual usage survey.

OPTION 4: ANNUAL INSPECTION OF A RANDOM SAMPLE OF CPAS FROM CPA USING THE SAME ICS MODEL

Objectives and reliability requirements

The objective is to estimate the share of days or cooking events where renewable biomass was used as fuel of the project improved cook stoves (ICS) with 95/10 confidence/precision (in the following the "*share of RB use*").

Target population

The target population is the total number of ICS installed by the CPA at the end of the year that are in use. The primary means to uniquely identify the activities under the CPA is by means of buyer information collected through Sales Agreements and the unique numbering of each ICS. The sales data will be stored in the CPA's records in the PoA's electronic database. The total number of cook stoves that are in use will be identified through either one or a combination of the following activities that will be stored in the monitoring database: The database will be continually updated with the following events: (a) an annual maintenance/repair event (b) customer inspections resulting from loan or hire purchase agreements (c) double verified records of community-based stove monitoring staff (d) independent monitoring verification exercises organised by the CME (e) annual usage survey.

The data to be collected on each sampling unit (ICS) is the share of RB use.

Sampling method

Multistage sampling will be used. A number of ICS in each cohort within the selected CPAs operating the same Stove Model will be sampled using simple random sampling with the aid of a computerised randomiser. The PoA database of stove and user information established through the Sales Agreements and subsequently updated on a continuous basis will be used to identify ICS in use that will be used as the sampling frame. The database will be continually updated with the following events: (a) an annual maintenance/repair event (b) customer inspections resulting from loan or hire purchase agreements (c) double verified records of community-based stove monitoring staff (d) independent monitoring verification exercises organised by the CME (e) annual usage survey.

Sample size

The required sample size will be determined using multistage sampling.

The equation for the number of clusters (CPAs) to be sampled is:

$$C \geq \frac{\frac{SD_B^2}{clustermean^2} X \frac{M}{M-1} + \frac{1}{\bar{u}} X \frac{SD_W^2}{overallmean^2} X \frac{(\bar{N}-\bar{u})}{(\bar{N}-1)}}{\frac{0.1^2}{1.96^2} + \frac{1}{M-1} \frac{SD_B^2}{clustermean^2}}$$

Where:

C	Number of groups/clusters/CPAs that should be sampled
M	The total number of clusters (CPAs) in the population
$\bar{u}$	Number of (ICS/households) to be sampled within each cluster (CPA)
$\bar{N}$	Average units (ICS/households) per cluster (CPA)
SD_B^2	Variance between clusters (CPA)
SD_W^2	Average within cluster (CPA) variation
1.96	Represents the 95% confidence required
0.1	Represents the 10% relative precision

The minimum sample sizes -for the different scenarios- required to meet the confidence and precision requirements are given in a computation spreadsheet.

Summary results for different possible numbers of CPAs are found in the following table for an assumed share of RB use from 0.4 to 0.6:

Number of ICS to be sampled from each CPA	Adjusted Number of ICS to be sampled from each CPA	Total sample size of CPAs
10	13	444
50	63	96
100	125	53
150	188	38
200	250	31
250	313	27
300	375	24
400	500	20
500	625	18

Sampling frame

The PoA database of stove and user information established through the Sales Agreements and subsequently updated on a continuous basis will be used to identify ICS in use that will be used as the sampling frame. The database will be continually updated with the following events: (a) an annual maintenance/repair event (b) customer inspections resulting from loan or hire purchase agreements (c) double verified records of community-based stove monitoring staff (d) independent monitoring verification exercises organised by the CME (e) annual usage survey. The stoves in the PoA database will be classified by Stove Model by CPA for sampling purposes.

DATA

Field measurements

The main variable that will be measured by the survey is the share of RB use of ICS in use.

Quality assurance/quality control

A team of research assistants and supervisors for the usage survey will be recruited and trained in all aspects of sampling, data collection and interviewing by the CME or a CME-appointed agent. The training will involve both theoretical and practical aspects to ensure that all the research assistants are competent to collect the desired data. Data collection protocols will be prepared and given to the research assistants and supervisors to guide them during the data collection exercise. In addition, there will be a supervisor from the CME head office. Mobile devices, for instance mobile phones and other devices, will be used to electronically send data to the central database at the CME head office. The updating of the PoA's central database will be strictly monitored with several permission levels and passwords. In cases where the use of mobile devices is impossible, paper copies of questionnaires will be used to collect data about the usage of ICS from the selected sample.

The data collection protocols prepared for the research assistants will include the procedures for handling cases of non-response (refusals, not-at-home, out-of-population cases and related cases). A variable will be included to capture the results of interviews with the following 4 options: responded, out-of-population, refused, not-at-home. The protocols will also include the roles and responsibilities of the research assistants and supervisor. In addition, the definition of each of the study variables, mode of data collection and recording will be highlighted in the data collection protocol.

In case of non-response as a result of respondents not being at home, there will be at least 3 call backs. Oversampling will also be undertaken to take care of non-response.

In addition, supplier organisations will be trained in all aspects of data collection and recording, especially using mobile devices and other relevant technologies, for the continuous updating and monitoring of data in the PoA's central database.

Check programs will also be prepared to automatically reject defective data and automatically notify the testers that the data is defective for immediate verification and rectification or call back.

Analysis

The data obtained from the selected households owning the ICS will be further cleaned and validated for accuracy and analysed by the CME's Monitoring Manager. All survey data will be captured in a computerised database. The analysis will include computation of the share of RB use of ICS in use. The results will be summarised using the pre-specified level of confidence. The precision of the estimates (share of RB use of ICS in use) will be checked to ensure that the estimate is within the pre-specified reliability precision. Computing and evaluating the standard error of the share of RB use to establish whether it is within the permissible limits will check the reliability of the estimates.

IMPLEMENTATION

Implementation Plan

The Monitoring Manager will be responsible for data collection and data analysis. The Monitoring Manager has experience in sampling and surveys. The schedule for implementing the sampling will be set out by the Monitoring Manager.

Sampling design

Since this is a multi-country POA, the CPAs admitted to the POA may choose in advance a suitable sampling plan from one of the following 4 options based on the estimated monitoring costs associated with each option-monitoring costs for the 4 options are expected to vary depending on the geographical coverage of the CPA and the CPA's existing monitoring/tracking system in addition to the envisaged risks and benefits of each option.

B.7.3. Other elements of monitoring plan

>>

The monitoring plan describes how to collect, assess and archive all relevant data to be monitored according to the methodology. Data from the monitoring procedures will be recorded in the electronic project database and summarized in the Monitoring Report. The data collection that will follow the " Standard for Sampling and Surveys for CDM Project Activities and Programme of Activities (Version 02.0)"[48], will comply with the requirements for the verification stated in section C of PoA-DD (Part I) of transparency and double-counting avoidance, and will check the required parameters in the methodology AMS II.G (version 03) and AMS-I.E. (version 06.0) in an unbiased and reliable way. A clear procedure will be enforced by the CME on each SO to identify cohorts of stove users switching to the use of renewable biomass to ensure that the total amount of renewable biomass delivered/sold under the project activity will be consistent with the number of households belonging to the AMS-I.E. component.

The procedure will involve an early prior notification (in accordance with the PoA's Management Rules) to the CME by each SO of the current practice or plans to supply renewable biomass fuels to specific groups of households, whereby the CME can be satisfied about the integrity of the plans. The date of the switch will be conservatively set when all the cohort of stove users have made the switch, as confirmed by the SO, and accepted by the CME. All SOs will have a contractual obligation to notify the CME of any reversals in the use of renewable biomass fuels to ensure and indicate, which type of baseline (AMS-I.E. or AMS-II.G) each participant household belongs to at anytime during the crediting period.

The monitoring plan consists of:

- Monitoring concept
- Monitoring requirements and procedures for replacement of traditional stoves
- Monitoring requirements and procedures for efficiency of ICS
- Requirement for annual consumption of renewable biomass

[48] EB 65 Report, Annex 2

- Requirements for 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 service appliance.
- Requirements for displacement or substitution, of non-renewable woody biomass at each location.
- Requirements for amount of thermal energy generated by the new renewable energy technology in the project in year
- Data collection
- Data archiving
- Training
- Quality Assurance/Quality Control Procedures
- Monitoring Report
- Monitoring responsibilities

Monitoring concept

The CME will be responsible for the collection of all Sales Agreement data, for internally verifying the information in the Sales Agreements, and the creation of the Monitoring Report at the end of each Monitoring Period. The SO will be responsible for data entry into the Sales Records and will submit it to the CME for screening and for ensuring that the information in the Sales Agreements is complete and correct. The total amount of Sales Agreements will reveal the quantity of stoves sold at the end of a Monitoring Period. The electronic database will record the start and end dates of each selling year y for each ICS (t fraction), and calculate the emission reductions attributable to each Monitoring Period. Appropriate record keeping procedures will be implemented to ensure that each Monitoring Period dataset can be transparently attributed to its corresponding CPA, preventing any occurrences of double- counting. Hence, the project database will keep records on the current status of each CPA—the duration of previous Monitoring Periods, the household surveys, and verification activities. The monitoring sampling will be tracked through the PoA's electronic database that consolidates the Sales Records from all CPAs.

In order to account for drop-off in use (U)[49], the ICS deployed by the SO will be monitored through a census[50] and/or a usage survey. A census and/or a representative sample will be selected to count for drop-off or disposal of ICS. Sampling size will be chosen to achieve a 90/10 or 95/10 precision when annual sampling is chosen, dependant on the use of either option one, two or four from the sampling plan[51]. Sampling size will be chosen to achieve a 95/5 precision when option 3, biennial sampling, is chosen from the sampling plan. In cases where survey results indicate that the precision level is not achieved the lower bound of the confidence interval may be chosen instead of repeating the survey effort. In order to avoid this situation, oversampling will be encouraged. In cases where a SO chooses the option of a census for monitoring purposes, monitoring may include a record of one or a combination of the following activities or events:

(a) An annual maintenance/repair event
(b) Customer inspections resulting from loan or hire purchase agreements

[49] Paragraph 16 of AMS II.G (version 03)

[50] See Annex 4

[51] See Annex 4

(c) Double verified records of community-based stove monitoring staff
(d) Independent monitoring verification exercises organised by the CME.

In general, a cohort is defined as the year that an ICS model is sold in or gone through maintenance in the same year.

Cohorts of ICS that are older than the expected normal lifetime of the ICS may or may not be included in the monitoring, and accordingly regarded in the calculation of emission reductions. A decision to cut off older cohorts will depend on the guarantee and maintenance policy adopted by the SO and will be decided by the CME.

Concerning the sampling of ICS for the efficiency[52] check[53], ICS will be grouped according to exclusive and exhaustive characteristics that significantly affect the ICS's lifetime, such as final user size (domestic/institutional) and type (fixed built-in/transportable) and cohort/age. The sample to be selected from each stratum will follow the required precision or the lower bound of the confidence interval and the necessary sampling requirements[54]. In cases where different SOs are distributing the same model of ICS manufactured by the same organisation, and it can be safely assumed a similar lifetime according to similar guarantee and maintenance policies, the CME may or may not decide to cluster the ICS of different SOs into the same cohort, safeguarding the transparency of being able to attribute each ICS according to its CPA.

Requirements for replacement of traditional stoves

Monitoring shall ensure that either the replaced low efficiency appliances are disposed of and are not used within the boundary or within the region, or if baseline stoves continue to be used, that wood fuel consumption of those stoves is excluded from calculations.

Monitoring procedures

It will be checked if replaced low efficiency appliances have been dismantled and are no longer in use by the households or any other households within the project boundary, or if baseline appliances are still in use, then monitoring will ensure that fuel wood consumed by these stoves is excluded from the B_{old} calculation.

During usage surveys, if evidence of use of traditional cooking appliances is found in households that have purchased an ICS the following criteria will be taken into consideration for adjustment:

1. If the use of traditional appliances is only during peak cooking needs (e.g. for celebrations) then it can be assumed that there is no adjustment needed because the baseline studies will be performed in households during normal cooking conditions and data from peak cooking will be removed from Bold calculations.

2. If the household size is larger than can be reasonably assumed to be satisfied by the ICS in question (e.g. a small ICS for a household of 4 is used in a household of 8 together with a traditional stove) then it can be assumed that the ICS is being fully utilized and no adjustment should be applied.

[52] See Annex 4

[53] Paragraph 15 of AMS II.G (version 03)

[54] EB 65 Report, Annex 2

3. If the ICS ownership has been transferred (e.g. sales or gifts) and the ICS can be found to be still in use, no adjustment is needed.

4. If none of the above cases is true, then adjustment for that household will be estimated on the basis of an interview to conservatively estimate the fraction of time in which the ICS is in use. The total adjustment for that CPA will hence be based on the sampling and statistics described in the monitoring concept and its annexes.

Requirements for efficiency of ICS

A check of efficiency of a representative sample will be carried out annually or at least every two years to test the efficiency of the ICS in use. The WBT or any other appropriate test will be used for this purpose. Tests during monitoring will be performed by the CME and/or by an authorised organisation designated by the CME.

Monitoring procedures

The parameter for the efficiency, the efficiency (η_{new}) or the specific fuel consumption of deployed ICS (SC_{new}), will be tested at least every two years by the CME and/or by an authorised organisation designated by the CME. Tests on η_{new} or SC_{old} for the Monitoring Report will be carried out on stoves selected from the usage survey. It will be permissible to reduce the number of tests by first testing the oldest cohort, and then deciding whether or not a test of younger stoves is necessary. If stoves of a certain cohort are found to achieve a certain performance level, a conservative estimation may be applied to younger stoves if this is preferred to conducting further tests.

Requirement for annual consumption of renewable biomass

The precise procedure for monitoring of the quantity of renewable biomass used will be determined on CPA-level, as different methods of supply will be adopted in different CPAs. Examples of monitoring approaches dependent on supply methods are (a) Supply contracts, (b) receipts and delivery notes confirming supply of specified volumes to users, (c) retailer records of sales of renewable biomass to registered stove users (d) survey of users as further described in the sampling plan.

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 service appliance:

A sampling survey of all users as contained in the database will be carried out to determine the fraction of operational project stoves (the parameter n_y as described in the sampling plan below).

Displacement or substitution, of non-renewable woody biomass at each location:

Monitoring shall confirm the displacement or substitution of NRB. The f_{NRB} as per equation 4 of AMS-I.E. (version 06.0) shall be determined for each CPA and monitored ex-post for each monitoring period.

Data collection[55]

[55] The project participant may decide not to claim emission reductions from the use of renewable biomass for a specific monitoring period. Accordingly, monitoring of the parameters only required for the AMS-I.E. component may be omitted for such a monitoring period

The CME will collect the data necessary for the monitoring and for the emission reductions calculation. Data will be managed through an electronic database that can directly attribute the data to the CPA, thereby allowing unambiguous determination of the emission reductions attributable to each CPA.

Data archiving

Sales Agreements will be stored by the CME. A back-up of the project database will also be stored on an electric medium by the CME. All data monitored and required for verification and issuance will be kept for at least two years after the end of the crediting period or the last issuance of CERs for the project activity, whichever is later.

Training

The CME will provide the necessary training to the SOs and the parties involved in the monitoring to ensure that the data recorded is complete and accurate. This monitoring training will be provided by the CME to the SOs before the inclusion of their CPAs, and also to the monitoring and testing groups before the Monitoring Period exercises start.

Quality Assurance/Quality Control Procedures

Different quality control and quality assurance measures will be put in place by the CME to ensure that all emission reductions are real. Surveys and testing will be carried out and the CME will check the consistency of the results. The CME, through its monitoring manager, will ensure that the studies are accurate and that a conservative approach has been taken.

Sales records will be scrutinized by the SO to avoid double-counting and the CME will also conduct spot-checks to verify the legitimacy of such records. Sales Agreements will be checked at three levels, by the vendor, the SO and the CME, and missing or wrong data will be corrected wherever possible. In cases where it is not possible, any mandatory missing data will automatically invalidate that ICS and the *t fraction* will be counted as zero resulting in no emission reductions being generated by that appliance. Wrong data entered in the Sales Agreement that lead to an inability to track ICS during monitoring will result in a lower usage rate. However in cases where the ICS can be traced, and missing information can be corrected, the new data will be updated in the Sales Agreement and the electronic Sales Record.

Monitoring Report

The CME will assess all monitoring data and produce a Monitoring Report corresponding to the preceding Monitoring Period of the required sample of CPAs for the DOE to verify. This report will present the data relating to the emission reductions generated by CPAs during the Monitoring Period. The Monitoring Report will also include, as required by the sampling plan:

1. Unbiased and reliable estimates of the mean value of parameters used in the calculation of greenhouse gas emission reductions.

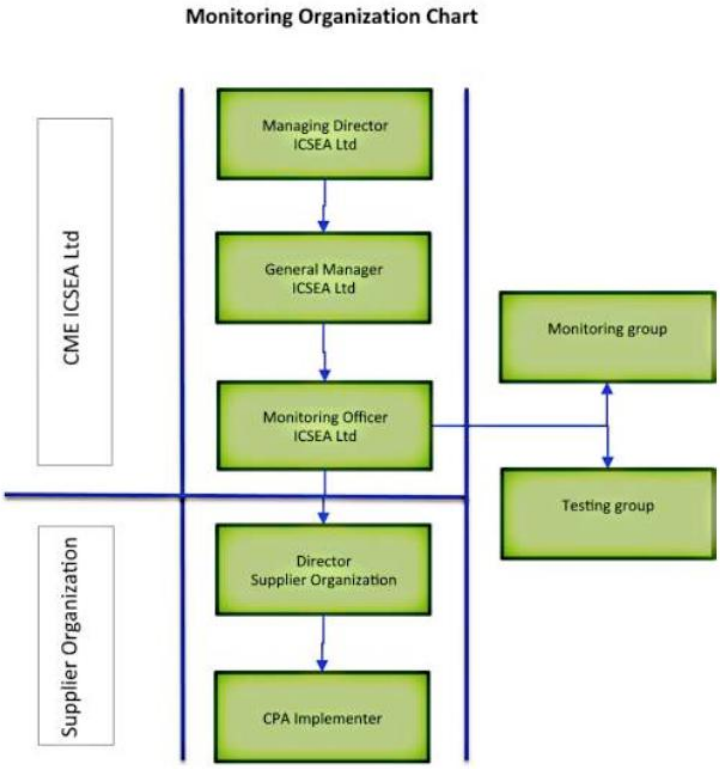
2. Necessary precision of estimated parameters if required, or the lower bound of the confidence interval and the necessary sampling requirements.

3. Formulas used in calculating and reporting parameters.

Generally, the Monitoring Report will use the current CDM Monitoring Report Form and follow the current "Guidelines for completing the Monitoring Report Form".

Monitoring Responsibilities

The CME is in charge of supervising all the monitoring activities through its general manager and managing director, but it is the monitoring manager who will have the direct responsibility for all the monitoring activities, including data collection, data monitoring, and writing the Monitoring Report. The SOs and their CPAs will support the CME in all the monitoring activities by collecting the Sales Agreements and facilitating the tracking of the ICS and helping the monitoring and testing groups. The monitoring and testing groups will conduct their respective studies for monitoring the required parameters, but the final responsibility for the data contained in the Monitoring Report belongs to the CME.



SECTION C. Duration and crediting period

C.1. Duration of project

C.1.1. Start date of project

>> (Specify start date of the project, in the format of DD/MM/YYYY. Describe how this date has been determined as per the definition of start date provided in section 3.4.3 of GS4GG Principles & Requirements document and provide evidence to support this date.)

The start date of this CDM Component Project Activity (CPA) is 10/02/2017, it is the date on which first stove under the CPA was sold to the end user.

The starting date of this CPA is after the commencement of validation of the Programme of Activities, i.e. 11/11/2010 the date on which the CDM-POA-DD was published for global stakeholder consultation.

C.1.2. Expected operational lifetime of project

>> (Specify in years)

21 years

C.2. Crediting period of project

C.2.1. Start date of crediting period

>> (Specify in dd/mm/yyyy. This can be start of project operation or two years prior to the date of Project Design Certification, whichever is later.)

The start date of the crediting period of this CPA is 01/02/2018 or the date of inclusion of the CPA, whichever is later

C.2.2. Total length of crediting period

>> (Specify the total length of crediting period sought in line with GS4GG Principles & Requirements or relevant activity requirements.)

21 years

The first crediting period is 7 years. The number of renewal periods is 2. The duration of the crediting period is limited to the end date of the PoA regardless of when the CPA is added.

SECTION D. Safeguarding principles assessment

D.1. Analysis of social, economic and environmental impacts

>> (Refer the GS4GG Safeguarding Principles and Requirements document for detailed guidance on carrying out this assessment.)

Safeguarding principles	Assessment questions	Assessment of relevance to the project (Yes/Potentially/No)	Justification	Mitigation measure (if required)
SOCIAL & ECONOMIC				
Principle 1 - Human Rights	a) Do you foresee that the implementation of the project	No	Uganda has ratified the Rome Statute established by the Coalition for the International Criminal	Not Applicable

	may lead to a risk of violation of human rights?		Court. The project respects internationally proclaimed human rights including dignity, cultural property and uniqueness of indigenous people. The project is not complicit in Human Rights abuses. The impact on settlement and cultural heritage is deemed to be positive, as many displaced people can return home with less scarcity of cooking fuels.	
Principle 2 – Gender Equality and Women's Rights	a) Is there a possibility that the project might reduce or put at risk women's access to or control of resources, entitlements and benefits?	No	Uganda has ratified the ILO convention C100 (Equal Remuneration) and C111 (Discrimination). Neither the PoA nor the CPA are involved in discrimination. There is no such risk involved in the project.	Not Applicable
	b) Is there a possibility that the project can adversely affect men and women in marginalised or vulnerable communities (e.g., potential increased burden on women or social isolation of men)?	No	The collection of fuel imposes a serious time burden on women and children and alleviating this drudgery will contribute to promoting gender equality and empowering women	Not Applicable
	c) Is there a	No	The project has been	Not Applicable

	possibility that the project might not take into account gender roles and the abilities of women or men to participate in the decisions/designs of the project's activities (such as lack of time, childcare duties, low literacy or educational levels, or societal discrimination)?		designed in a participatory way and taking into account the respective roles that men and women play in the targeted communities.	
	d) Does the project take into account gender roles and the abilities of women or men to benefit from the project's activities (e.g., does the project criteria ensure that it includes minority groups or landless peoples)?	No	The project design is consultative and takes into account everyone's roles and abilities.	Not Applicable
	e) Does the project's design contribute to an increase in	No	The project reduces the women's workload in fuel collection and cooking.	Not Applicable.

	women's workload that adds to their care responsibilities or that prevents them from engaging in other activities?			
	f) Would the project potentially reproduce or further deepen discrimination against women based on gender, for instance, regarding their full participation in design and implementation or access to opportunities and benefits?	No	Uganda has ratified the ILO convention C100 (Equal Remuneration) and C111 (Discrimination). Neither the PoA nor the CPA are involved in discrimination. There is no such risk involved in the project.	Aid Africa provides a safe and harassment-free environment. The Aid Africa management immediately deals with any reported case(s) of harassment.
	g) Would the project potentially limit women's ability to use, develop and protect natural resources, taking into account different roles and priorities of	No	The project will support women to contribute significantly to the protection of forests and trees.	Not Applicable

	women and men in accessing and managing environmental goods and services?			
	h) Is there a likelihood that the proposed project would expose women and girls to further risks or hazards?	No	The project will reduce the exposure of women to dangerous emissions and the hazards of collecting fuel.	Not Applicable
Principle 3 - Community Health, Safety and Working Conditions	a) Is there a likelihood that the proposed project would expose the community to increased health risks and adversely affect the health of its workers and the community?	Potentially	The project provides workers with a safe and healthy work environment and is not complicit in exposing workers to unsafe or unhealthy work environments.	Regular monitoring process by Aid Africa to ensure staff wear their protective gear. Aid Africa will provide an annual incident report on any health and safety issues, in accordance with its Occupational Health and Safety Policy.
Principle 4 - Cultural Heritage, Indigenous Peoples, Displacement	a) Does the project area include sites, structures, or objects with historical,	No	The project does not involve and is not complicit in the alteration, damage or removal of any critical cultural heritage. No cultural heritage will be	Not Applicable

and Resettlement - Sites of Cultural and Historical Heritage	cultural, artistic, traditional or religious values or intangible forms of culture (e.g., knowledge, innovations, or practices)?		altered by the project.	
Principle 4 - Cultural Heritage, Indigenous Peoples, Displacement and Resettlement - Forced Eviction and Displacement	a) Does the project require or cause the physical or economic relocation of peoples (temporary or permanent, full or partial)?	No	The project does not involve and is not complicit in involuntary resettlement.	Not Applicable
Principle 4 - Cultural Heritage, Indigenous Peoples, Displacement and Resettlement - Land Tenure and Other rights	a) Does the project require any change to land tenure arrangements and/or other rights?	No	The project does not involve any land and property rights related issues	Not Applicable
Principle 4 - Cultural Heritage,	a) Are indigenous peoples present	No	The project is directed only at project members and no other indigenous	Not Applicable

Indigenous Peoples, Displacement and Resettlement - Indigenous People	in or within the area of influence of the project and/or is the project located on land/territory claimed by indigenous peoples?		communities are affected.	
Principle 5- Corruption	a) Will the project lead to acts of corruption?	Potentially	Uganda ratified the United Nations Convention against Corruption. However, corruption is prevalent at many levels in the region and is identified as one of the major project-specific risks. Issuance of fake stove sales receipts by producer or supplier. This is a risk given the intangible and unconventional nature of emission reductions as a commodity and the relatively large amount of money involved. Inconsistency of stove manufacturing quality affecting the effective reduction of emissions. There is a risk that suppliers could be tempted to "cut corners" in an effort to reduce the cost and retain higher profits.	Regular monitoring process through unannounced visits and/or phone calls to users. Disciplinary action and possible legal actions if fraud is encountered, or suspension of the CPA. CME lab tests on random samples taken from end users for the stove models/brands. Feedback about the results to the supplier/ manufacturer. Progressive disciplinary

				actions on suppliers that produce deficient ICS.
Principle 6 – Economic Impacts - Labour Rights	a) Will the project lead to abuse of labour rights?	No	Uganda has ratified the ILO convention C087 (Freedom of Association) and C098 (Right to Organise and Collective Bargain Association). Neither the PoA nor the CPA is restricting employees to these freedoms and rights Uganda has ratified the ILO convention C182 (Worst Forms of Child Forced Labour). As for local factors, child labour is generally tolerated in the region and the risk of sexual harassment is real. However, given the exemplary reputation of Aid Africa, the small and controlled labour force of this CPA and the minimum number of suppliers involved, the risk of being complicit is negligible.	Aid Africa operates in a transparent way – all staff are provided with contracts and payment information and are informed of their rights in case of a breach. Aid Africa carries out identity checks on all new staff to ensure that no one below the legal working age is employed in any area of our operations.
Principle 6 – Economic Impacts - Negative economic consequences	a) Do you foresee any negative economic consequences from the project?	No	The project will provide new employment opportunities, and improve households' disposable incomes ,which will provide positive economic outcomes.	Not Applicable.

ENVIRONMENTAL & ECOLOGICAL				
Principle 1 – Climate and Energy - Emissions	a) Will the project increase greenhouse gas emissions over the Baseline Scenario?	No	The project will in fact significantly reduce carbon dioxide emissions	Not Applicable.
Principle 1 – Climate and Energy - Energy Supply	a) Will the project use energy from a local grid or power supply (i.e., not connected to a national or regional grid) or fuel resource (such as wood, biomass) that provides for other local users?	No	The project will use biomass fuel.	Not Applicable
Principle 2 – Water - Impact on Natural Water Pattern/Flows	a) Will the project affect the natural or pre-existing pattern of watercourses, ground-water and/or the watershed(s) such as high seasonal flow variability, flooding potential, lack of aquatic connectivity or	No	Not Applicable	Not Applicable

	water scarcity?			
Principle 2 – Water - Erosion and/or Water Body Instability	a) Could the project directly or indirectly cause additional erosion and/or water body instability or disrupt the natural pattern of erosion?	No	The project will reduce the use of biomass fuel such as trees, and hence the risk of erosion will be lowered.	Not Applicable
	b) Is the project's area of influence susceptible to excessive erosion and/or water body instability?	No	Not relevant, see above.	Not Applicable
Principle 3 – Environment, ecology and land use - Landscape, modification and Soil	a) Does the project involve the use of land and soil for production of crops or other products?	No	The project does not involve the use of land for any such production.	Not Applicable
Principle 3 – Environment, ecology and land use - Vulnerability to Natural Disaster	a) Will the project be susceptible to or lead to increased vulnerability to wind, earthquakes, subsidence, landslides,	No	Not Applicable	Not Applicable

	erosion, flooding, drought or other extreme climatic conditions?			
Principle 3 – Environment, ecology and land use - Genetic Resources	a) Could the project be negatively impacted by the use of genetically modified organisms or GMOs (e.g., contamination, collection and/or harvesting, commercial development)?	No	Not Applicable	Not Applicable
Principle 3 – Environment, ecology and land use - Release of pollutants	a) Could the project potentially result in the release of pollutants to the environment?	No	Not Applicable	Not Applicable
Principle 3 – Environment, ecology and land use - Hazardous and non-hazardous waste	a) Will the project involve the manufacture, trade, release, and/ or use of hazardous and non-hazardous chemicals and/or materials?	No	Not Applicable	Not Applicable

Principle 3 – Environment, ecology and land use - Pesticide and Fertiliser	a) Will the project involve the application of pesticides and/or fertilisers?	No	Not Applicable	Not Applicable
Principle 3 – Environment, ecology and land use - Harvesting of forests	a) Will the project involve the harvesting of forests?	No	The project will reduce the need for tree cutting because of the use of more efficient stoves	Not Applicable
Principle 3 – Environment, ecology and land use - Food	a) Does the project modify the quantity or nutritional quality of food available such as through crop regime alteration or export or economic incentives?	No	Not Applicable	Not Applicable.
Principle 3 – Environment, ecology and land use - Animal husbandry	a) Will the project involve animal husbandry?	No	Not Applicable	Not Applicable
Principle 3 – Environment, ecology and	a) Does the project physically affect	Potentially	The project does not involve and is not complicit in significant conversion or	Aid Africa sources clay responsibly from

land use - High Conservation Value (HCV) Areas and Critical Habitats	or alter largely intact or High Conservation Value (HCV) ecosystems, critical habitats, landscapes, key biodiversity areas or sites identified?		degradation of critical natural habitats, including those that are: (a) legally protected, (b) officially proposed for protection, (c) identified by authoritative sources for their high conservation value or (d) recognised as protected by traditional local communities.	wetlands, in an area approved for this specific purpose by NEMA.
Principle 3 – Environment, ecology and land use - Endangered Species	a) Are there any endangered species identified as potentially being present within the project boundary (including those that may route through the area)?	No	Not Applicable	Not Applicable
	b) Does the project potentially impact other areas where endangered species may be present through transboundary affects?	No	Not Applicable	Not Applicable

SECTION E. Local stakeholder consultation

E.1. Solicitation of comments from stakeholders

>> (Describe how stakeholder consultation was conducted in accordance with GS4GG Stakeholder Procedure Requirements and Guidelines.)

A Stakeholder Consultation meeting was held at St. Monica Girls Tailoring Centre on Lagony Road in Gulu, Uganda on Thursday 8 December 2016 in accordance with GS4GG Stakeholder Procedure Requirements and Guidelines. The comments to be taken into account were made during the sustainable development exercise and continuous input / grievance method selection.

E.2. Summary of comments received

>> (Provide a summary of key comments received during the consultation process.)

Key comments received from the stakeholders during the consultation process were almost all positive in nature.

E.3. Report on consideration of comments received

>> (Describe how the comments have been addressed by providing a clarification to the stakeholder or by altering the design of the project or by proposing to monitor any anticipated negative impacts etc.)

A summary of issues raised and Aid Africa's response to these issues appear below:

Stakeholder comment	Was comment taken into account (Yes/ No)?	Explanation (Why? How?)
Which stove is better?	Yes	Aid Africa can distribute any stove whether portable/fixed, domestic/institutional, using non-renewable/renewable biomass fuel. The stove selection must: 1) suit the community's cooking needs (typically firewood stoves for rural communities and charcoal stoves for peri-urban communities); and 2) pass the thermal efficiency threshold of 20% and safety test in accordance with the ICSEA

		Rating Test Protocol.
Concern that this project appears to be exclusively for Aid Africa members.	Yes	Aid Africa will start distributing these stoves for carbon credit earnings as a benefit to its members and those interested in earning carbon credits on their stoves can register with Aid Africa. It is a lot easier to track and monitor stoves that are with members because Aid Africa has each member listed in its database.
Concerned about the cost of the stove.	Yes	Aid Africa will distribute the stoves for free.
Will members get a copy of the report of the meeting?	Yes	Copies of the Local Stakeholder Consultation Report, and the Project Design Document will be made available to all participants during the Stakeholder Feedback Round. All participants will be invited to make comments on the documents. Hard copies of the documents will also be available at the Aid Africa office in Gulu.

There were no major sustainable development concerns raised during the stakeholder consultation process. It is therefore not necessary to change the project design, as it is not necessary to incorporate any additional measures to limit or avoid any negative impacts. As a whole the project is perceived to be very positive in terms of the two categories of sustainability: Social & Economic, and Environmental & Ecological.

Appendix 1. Contact information of project participants

Organization name	Aid Africa
Registration number with relevant authority	NGO Registration Number: S.5914/7121, NGO Registration Board of the Republic of Uganda
Street/P.O. Box	P.O. Box 583
Building	
City	Gulu
State/Region	Northern Region
Postcode	
Country	Uganda
Telephone	+256 775 591704 / +256 755 084135
Fax	
E-mail	peter@aidafrica.net
Website	www.aidafrica.net
Contact person	Peter Keller
Title	Director
Salutation	Mr.
Last name	Keller
Middle name	
First name	Peter
Department	
Mobile	Same as above
Direct fax	
Direct tel.	Same as above
Personal e-mail	Same as above

Appendix 2. Summary of post registration design changes

According to the CDM project standard the CME shall provide a summary of the post registration changes, including the reasons for the changes and any additional information relating to the changes to the PoA-DD. The following post registration changes are included:

(a) 1st post registration change (submitted 2012):

Expanding geographical coverage and including additional host Parties as follows:

i. South Africa
ii. Lesotho

This PRC request was approved on 14/06/2013.

(b) 2nd post registration change (submitted 2015):

In accordance with §290 item e) (i) of Project Standard (Version 09.0), the PRC involves addition of AMS-I.E. (version 06.0), which allow the use of renewable biomass as fuel in the ICS to replace the use of non-renewable biomass for thermal energy generation by the user. So, this change is in essence a change that allows a shift to a more efficient, less GHG-intensive measure. Furthermore, as a result of addition of AMS I.E (version 06.0) the following changes have been done in the PoA-DD:

i. Change in the project description in the PoA-DD to include description of measure involved in AMS I.E (version 06.0)
ii. Change in eligibility criteria of the PoA due to addition of AMS I.E (version 06.0) and in order to comply with the requirements of SSC WG clarification 624.
iii. Change in the monitoring plan including the monitoring parameters and data and parameter available at the time of validation due to addition of AMS I.E (version 06.0)
iv. Change in the methodological equations and assumptions for the calculation of emission reductions from the project.

At the same time the PoA-DD has been updated to comply with version 04.0 of the PoA-DD template (following transition from VVM to VVS).

This PRC request was approved on 28/06/2016.

(c) 3rd post registration change (submitted 2019):

Expanding geographical coverage and including additional host Party as follows:

i. Ethiopia

At the same time the PoA-DD has been updated to comply with version 09.0 of the PoA-DD template.

This PRC request was approved on 17/02/2020.