Programme of activities design document form
(Version 09.0)

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

BASIC INFORMATION	
Title of the PoA	Distribution of Improved Cook Stoves in Sub-Saharan Africa
Version number of the PoA-DD	21~~20~~
Completion date of the PoA-DD	~~29/05/2020~~16/07/2020
Coordinating/managing entity	C-Quest Capital Malaysia Global Stoves Limited
Host Parties	Senegal, Ghana, Nigeria, Malawi, Zambia, Zimbabwe.
Applied methodologies and standardized baselines	AMS-II.G. ver. 11 - Energy efficiency measures in thermal applications of non-renewable biomass
Sectoral scopes	Sectoral scope 3: Energy demand

PART I. Programme of activities (PoA)

SECTION A. Description of PoA

A.1. Purpose and general description of PoA

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1. General operating and implementing framework of PoA

This Small-Scale Programme of Activities (SSC-PoA) involves the promotion and distribution / installation of fuel-efficient improved cook stoves (ICS) in different countries in Africa. The ICS disseminated through this programme will replace the prevailing inefficient three-stone fires or traditional pot supports[1] with ICS that combust wood or charcoal fuels more efficiently and improve thermal transfer to pots, thus saving fuel and lowering greenhouse gas emissions.

C-Quest Capital Malaysia Global Stoves Limited (CQC) will be Coordinating Managing Entity (CME) of this SSC-PoA. Companies of the Republic of Korea- Ecoeye Co. Ltd., and Korea Impact Carbon Corporation will provide subsidy to distribute / install ICS on a commercial or a non-commercial basis by CPA Implementers[2] and shall bear all implementation cost of the CPAs to make it financially viable for CPA implementers to operate the CPAs. Carbon finance will be used to facilitate the purchase, distribution[3] and marketing of stoves, and make the ICS more affordable to users; without carbon finance, these activities would not take place.

The end user will be informed that carbon finance is being generated by the use of the ICS, and this finance is in turn used to lower the sales price of the ICS. The ICS customer will confirm, via the Registration Card[4], its agreement to transfer the rights to the carbon credits or certified emission reductions (CERs) generated to the CME and/or CPA Implementer. The Registration Card will contain the necessary information regarding the ICS unit and the end-user and the distributer/retailer of the ICS, allowing one (e.g. the CME or the DOE) to easily trace and identify each ICS when needed. This Information will populate the project database and will be stored by the CME in hard copy and/or in electronic format.

2. Policy/measure or stated goal of the PoA

The goal of this SSC-PoA is to make cleaner, more efficient improved cook stoves more affordable and available to households across Senegal, Ghana, Nigeria, Malawi, Zambia and Zimbabwe which at present use simple three stone fires or traditional pot supports that are inefficient and smoky. In turn, this will reduce global greenhouse gas emissions by increasing the efficiency of cooking and reducing the quantity of non-renewable woody biomass consumed. The end users of the ICS provided through this SSC-PoA will benefit from having improved access to the ICS market, a wider choice of high-quality ICS at affordable prices, and added investment in marketing. ICS will also reduce indoor air pollution levels and the various health risks associated with breathing polluted air, thus resulting in a range of social and economic benefits to users. The

[1] Traditional pot supports' as used in this PoA is taken to include tripods for open fires and various inefficient traditional charcoal stoves.

[2] The 'CPA Implementer' is the entity in charge of the distribution/installation and monitoring of ICSs in each CPA, under contract with the CME and as defined in Section A.1 Part II of the PoA-DD.

[3] Distribution' in this PoA-DD is considered also to include sales.

[4] The term 'registration card' as used in this PoA is taken to include electronic data recording/transfer mechanisms such as Short Message Service (SMS) and/or Information and Communication Technologies ('ICT' – such as PDAs) or hard copy. Information contained in the Registration Card and means of transferring this to the CME is explained in Section C. Management System.

proposed PoA will deliver a long-term, secure and simple contribution to sustainable development in the host countries that, without carbon finance, would not exist. Many of the ICS will be imported from outside the project boundaries, including Annex I countries. Thus, technology transfer is envisaged and considered under this SSC-POA.

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

This SSC-PoA is a voluntary action, and will be implemented by CQC, the CME. There are no mandatory laws, policies or targets in the countries listed in this PoA stipulating the adoption of ICS by households. The countries may, nevertheless, have policies to promote or encourage the dissemination of improved cookstoves.

4. Contribution to sustainable development

Many households in Sub-Saharan Africa use firewood or charcoal as their main source of cooking energy. The majority of people cooking with wood use three-stone fires to support the pots, and those that use charcoal, cook with simple traditional pot supports. The use of inefficient cook stoves and three- stone fires in homes has been found to cause considerable disease and death, particularly among women and children. The World Health Organisation[5] has found that 40% of all childhood pneumonia can be attributed to exposure to smoke from fires in homes, and exposure to smoke has been found to cause chronic lung disease in women. Approximately 1.5 million people die from smoke inhalation each year; most are women and children in low-income countries. Ill health can result in loss of productivity and costs associated with health care.

In many parts of Africa wood collection is a time-consuming burden that falls mainly on women[6]. Where wood and charcoal is purchased it poses a significant financial burden on families, given that so many households live below the poverty line. The inefficient use of woody biomass also places considerable and unnecessary pressure on local ecosystems and biomass resources, including forests. Reducing consumption of firewood and charcoal can reduce this pressure.

The proposed PoA contributes to sustainable development in a number of ways:

i. Environmental

- The PoA will help significantly reduce greenhouse gas emissions over its lifetime.
- The PoA will help reduce the use of non-renewable biomass from African forests, thus assist in conserving existing forest stock and the protection of natural forest eco-systems and wildlife habitats.
- The protection of standing forests will also help protect watersheds that regulate water table levels and prevent flash flooding.

ii. Social

- Considerably less time will need to be spent collecting wood fuel for the family home thereby reducing the work burden on rural families and presenting alternative opportunities for economic development.
- The amount of indoor pollutants from the burning of biomass in the family home will be reduced. Less carbon dioxide, carbon monoxide and particulates will be emitted due to the

[5] World Health Organisation World Health Report, 2002.

[6] Biran, A., J. Abbot, and R. Mace. 2004. Families and firewood: A comparative analysis of the costs and benefits of children in firewood collection and use in two rural communities in Sub-Saharan Africa. Human Ecology 32, no. 1: 1-25.

decrease in total biomass burned and an increase in the temperature of combustion.

- The stove provides a safer method for combusting biomass for cooking, helping to reduce burn injuries, especially for children, in the family home.

iii. Economic

- The PoA will help develop a section of the local economy; in the distribution, local assembly, maintenance and monitoring activities.
- Household expenditures on cooking fuel will be reduced through the use of the ICS.
- Saved household labour can be diverted to more productive economic activities.
- The POA will strengthen the employee base of partner organizations and create direct local employment opportunities in operational and management roles, as well as future assembly and/or manufacturing initiatives.

A.2. Physical/geographical boundary of PoA

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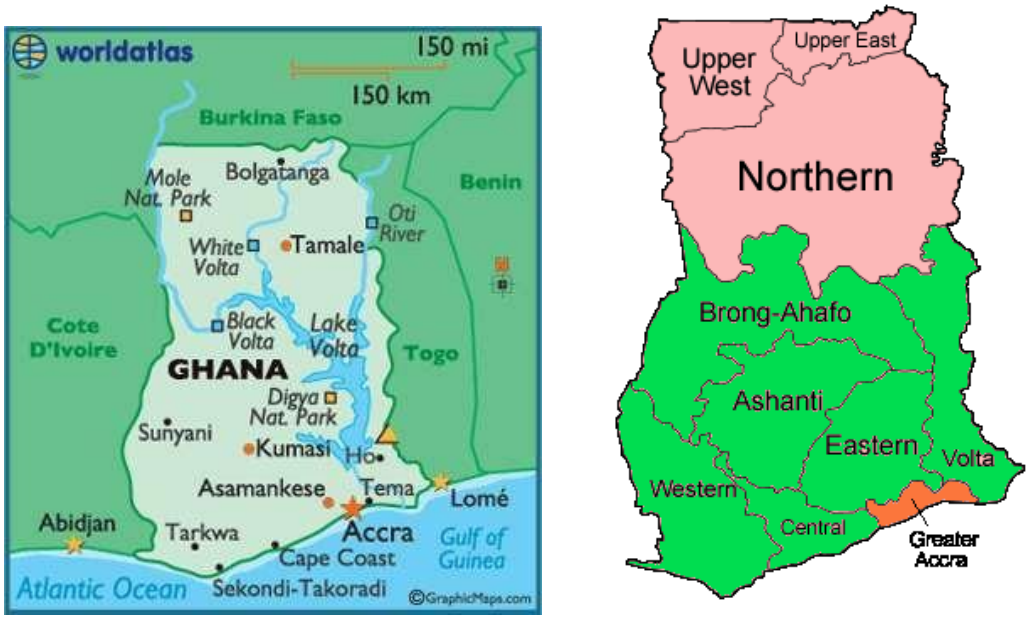
All SSC-CPAs included in this SSC-PoA will be implemented within the geographical boundary as per below. The boundaries will be the regional/geographic borders of the countries and specific to fuel type.

GHANA CHARCOAL BOUNDARIES:



Source: (left) WorldAtlas, http://www.worldatlas.com/webimage/countrys/africa/gh.htm (accessed October 5, 2012) (right) Map adapted from: Wikipedia contributors, "Ghana," *Wikipedia, The Free Encyclopedia,* http://en.wikipedia.org/w/index.php?title=Ghana&oldid=492718375 (accessed May 15, 2012).

Charcoal consumption data from Ghana revealed 3 distinct charcoal consumption clusters:[7]

- Urban and peri-urban[8] Greater Accra Area;

[7] See Baseline Charcoal Consumption Study for Ghana commissioned by C-Quest Capital to HED Consulting

[8] For purposes of this PoA, peri-urban households fall in the definition of urban area in Ghana which defines "urban" as localities with more than 5,000 or more persons (Ghana 2010 Population and Housing Census Summary Report of Final Results, page ix). Thus, since peri-urban localities are adjacent to urban areas these can be considered equal to urban areas.

- Urban Southern and Central Regions;[9] and
- Rural Southern and Central Regions.[10]

Greater Accra Region, Ghana (indicated in orange in the map above (right side))	
Northern Point Latitude: 05.998000° Longitude: 00.382000°	Western Point Latitude: 05.729000° Longitude: -00.512000°
Eastern Point Latitude: 05.790000° Longitude: 00.724000°	Southern Point Latitude: 05.496000 Longitude: -00.370000°

Southern and Central Regions, Ghana (indicated in green in the map above (right side))	
Northern Point Latitude: 08.766667° Longitude: -02.566667°	Western Point Latitude: 06.616667° Longitude: -03.216667°
Eastern Point Latitude: 06.100000° Longitude: 01.200000°	Southern Point Latitude: 04.750000° Longitude: -02.500000°

SENEGAL WOOD FUEL BOUNDARIES

Source: (left) WorldAtlas, http://www.worldatlas.com/webimage/countrys/africa/sn.htm (accessed October 5, 2012)

Senegal (national)

[9] These are localities with a population of 25,000 or more.

[10] Localities with less than 5,000 persons are classified as rural (Ghana 2010 Population and Housing Census Summary Report of Final Results, page ix). The population of a locality to determine if a given project area is rural or urban will be based on government data, other official sources, or publicly available studies.

Northern Point Latitude: 16.683333° Longitude: -14.966667°	Western Point Latitude: 14.750000° Longitude: -17.516667°
Eastern Point Latitude: 12.966667° Longitude: -11.350000°	Southern Point Latitude: 12.316667° Longitude: -12.350000°

Within these boundaries, Senegal Wood is restrained to rural households.[11]

SENEGAL CHARCOAL BOUNDARIES

Source: Adapted from: Wikipedia contributors, "Regions of Senegal," *Wikipedia, The Free Encyclopedia,* http://en.wikipedia.org/w/index.php?title=Regions_of_Senegal&oldid=485124339 (accessed March 18, 2012).

The project boundary for Senegal Charcoal includes urban areas within Dakar city, Kaolack city and St. Louis city.

[11] Urban areas in Senegal are defined as per the United Nations Demographic Yearbook (page 105) as "Agglomerations of 10,000 or more inhabitants." There is no specific definition for rural areas in Senegal, so these are considered to be all areas which are not urban (settlements of less than 10,000 inhabitants). Hence rural households are those which are physically located in a non-urban area of Senegal. The population of a settlement to determine if a given project area is rural or urban will be based on government data, other official sources, or publicly available studies. The determination will consider the total population in an agglomeration, irrespective of political boundaries which may partition a given agglomeration into different units.

The Dakar city project boundary includes specific areas within the department of Dakar, the departments of Guediawaye and Pikine in their entirety, and Rufisque (excluding rural areas within this last department). The specific areas within the department of Dakar are the districts of Arrondissement Pareceles Assainies and Camberene. GPS coordinates for these locations are below.

Arrondissement Parecelles Assainies, Dakar, Senegal (district)	
Northern Point Latitude: 14.771000° Longitude: -17.441000°	Western Point Latitude: 14.753000° Longitude: -17.455000°
Eastern Point Latitude: 14.757000° Longitude: -17.429000°	Southern Point Latitude: 14.749000° Longitude: -17.444000°

Camberene, Dakar, Senegal (district)	
Northern Point Latitude: 14.780000° Longitude: -17.411000°	Western Point Latitude: 14.771000° Longitude: -17.441000°
Eastern Point Latitude: 14.775000° Longitude: -17.409000°	Southern Point Latitude: 14.765000° Longitude: -17.427000°

Guediawaye, Dakar, Senegal (deparment)	
Northern Point Latitude: 14.792000° Longitude: -17.379000°	Western Point Latitude: 14.761000° Longitude: -17.430000°
Eastern Point Latitude: 14.785000° Longitude: -17.373000°	Southern Point Latitude: 14.745000° Longitude: -17.425000°

Pikine, Dakar, Senegal (department)	
Northern Point Latitude: 14.811000° Longitude: -17.329000°	Western Point Latitude: 14.745000° Longitude: -17.424000°
Eastern Point Latitude: 14.767000° Longitude: -17.309000°	Southern Point Latitude: 14.726000° Longitude: -17.318000°

Rufisque, Dakar, Senegal (department)	
Northern Point Latitude: 14.767000° Longitude: -17.309000°	Western Point Latitude: 14.726000° Longitude: -17.318000°
Eastern Point Latitude: 14.684000° Longitude: -17.224000°	Southern Point Latitude: 14.684000° Longitude: -17.224000°

The following departments within the city of Kaolack are included in the project boundary and include: Bongres; Boustane; Kasnack; Dialegne; Gawane; Ind Et Koundame; Leona; Medina; Ndangane; Ndorong; Ngane Alassane; Ngane Saer; Parcelles Assaines; Sam; Sara Ndiougari; Taba Ngoye 1; Tatba Ngoye 2; Thiofack; Kabatoki; N'gualel; and Lindiane Jardin.

City of Kaolack, Senegal

Northern Point Latitude: 14.193000° Longitude: -16.065000°	Western Point Latitude: 14.155000° Longitude: -16.116000°
Eastern Point Latitude: 14.163000° Longitude: -16.023000°	Southern Point Latitude: 14.122000° Longitude: -16.068000°

The following departments within the city of St. Louis are included in the project boundary. All departments included are: Bas Ndar Toute; Cite Niakh; Diamaguene; Diami Nar; Guet Ndar; Guet Ndar Lodo; Guinao Rail Darou Salam; Haut Ndar Toute; Khor; Leona; Leouna Eaux Claires; Medina Course; Ndiolofene Est; Pikine; Sor Daga; Sor Nord; Sor Sud; Sud (Sinidoni); and Dakar Bango.

City of St. Louis, Senegal[12]	
Northern Point Latitude: 16.076000° Longitude: -16.405000°	Western Point Latitude: 15.982000° Longitude: -16.513000°
Eastern Point Latitude: 16.073000° Longitude: -16.403000°	Southern Point Latitude: 15.965000 ° Longitude: -16.504000°

NIGERIA CHARCOAL BOUNDARIES

Source: (left) WorldAtlas, http://www.worldatlas.com/webimage/countrys/africa/ng.htm (accessed October 5, 2012) (right) Adapted from: Wikipedia contributors, "States of Nigeria," *Wikipedia, The Free Encyclopedia,* http://en.wikipedia.org/w/index.php?title=States_of_Nigeria&oldid=489486317 (accessed March 21st, 2012).

[12] The Nord department within the City of St. Louis was excluded from the boundaries of the PoA. The coordinates of the excluded department are: Northern Point Lat. 16.038600 and Long. -16.505400; Eastern Point Lat. 16.038000 and Long. -16.501900; Western Point Lat. 16.030700 and Long. -16.506300; Southern Point Lat.16.026000 and Long. -16.503700.

South-West Region, Nigeria (areas in green and blue on the map above, right side)	
Northern Point Latitude: 09.166667° Longitude: 03.850000°	Western Point Latitude: 07.866667° Longitude: 02.666667°
Eastern Point Latitude: 06.516667° Longitude: 06.650000°	Southern Point Latitude: 05.733333° Longitude: 05.883333°

Within these boundaries, the PoA will operate in cities with a population of 40,000 or higher,[13] except Benin City in the Edo State. These cities are divided into four different clusters:

- Urban Lagos[14]
- Peri-urban Lagos[15]
- Large cities (City of Ibadan)[16]
- Small cities[17]

NIGERIA WOOD BOUNDARIES

Map of Nigeria (Kano and Kaduna States highlighted in red)
Source: http://en.wikipedia.org/wiki/Kaduna_State

[13] Population size will be confirmed through the national or regional censuses or through publicly available sources (e.g. http://www.citypopulation.de/Nigeria-Cities.html)

[14] Includes the Local Government Areas of Agege, Ajeromi-Ifelodun (Ajegunle), Alimosho (Ikotun), Amuwo-Odofin (Festac Town), Apapa, Eti-Osa (Ikoyi), Ifako-Ijaye, Ikeja, Kosofe (Ogudu), Lagos Island, Lagos Mainland (Ebute- Metta), Mushin, Ojo, Oshodi-Isolo, Shomolu, and Surulere.

[15] Includes the Local Government Areas of Badagry, Epe, Ibeju Lekki, and Ikorodu.

[16] This cluster includes only the City of Ibadan in the state of Oyo.

[17] These are cities with a population of between 40,000 and 760,000.

Nigeria Wood boundaries include all areas (rural, peri-urban and urban) in the states of Kano and Kaduna.

Kano and Kaduna State, Nigeria (areas in red on the map above, right side)	
Kano State	
Northern Point Latitude: 12.566667° Longitude: 08.483333°	Western Point Latitude: 11.483333° Longitude: 07.683333°
Eastern Point Latitude: 11.550000° Longitude: 09.350000°	Southern Point Latitude: 10.533333° Longitude: 08.733333°
Kaduna State	
Northern Point Latitude: 11.483333° Longitude: 08.100000°	Western Point Latitude: 10.450000° Longitude: 06.083333°
Eastern Point Latitude: 10.333333° Longitude: 08.783333°	Southern Point Latitude: 09.000000° Longitude: 08.550000°

MALAWI WOOD BOUNDARIES

Republic of Malawi is divided into 3 regions – Northern, Central and Southern. The SSC-PoA will be implemented in the Republic of Malawi. The boundaries will be the geographic borders of the Republic of Malawi.

Malawi (National)

Malawi, Northern Point
Latitude: - 9.366667° S
Longitude: 33.000000° E

Malawi, Western Point
Latitude: - 13.600000° S
Longitude: 32.666667° E

Malawi, Eastern Point
Latitude: - 14.883333° S
Longitude: 35.916667° E

Malawi, Southern Point
Latitude: - 17.133333° S
Longitude: 35.283333° E

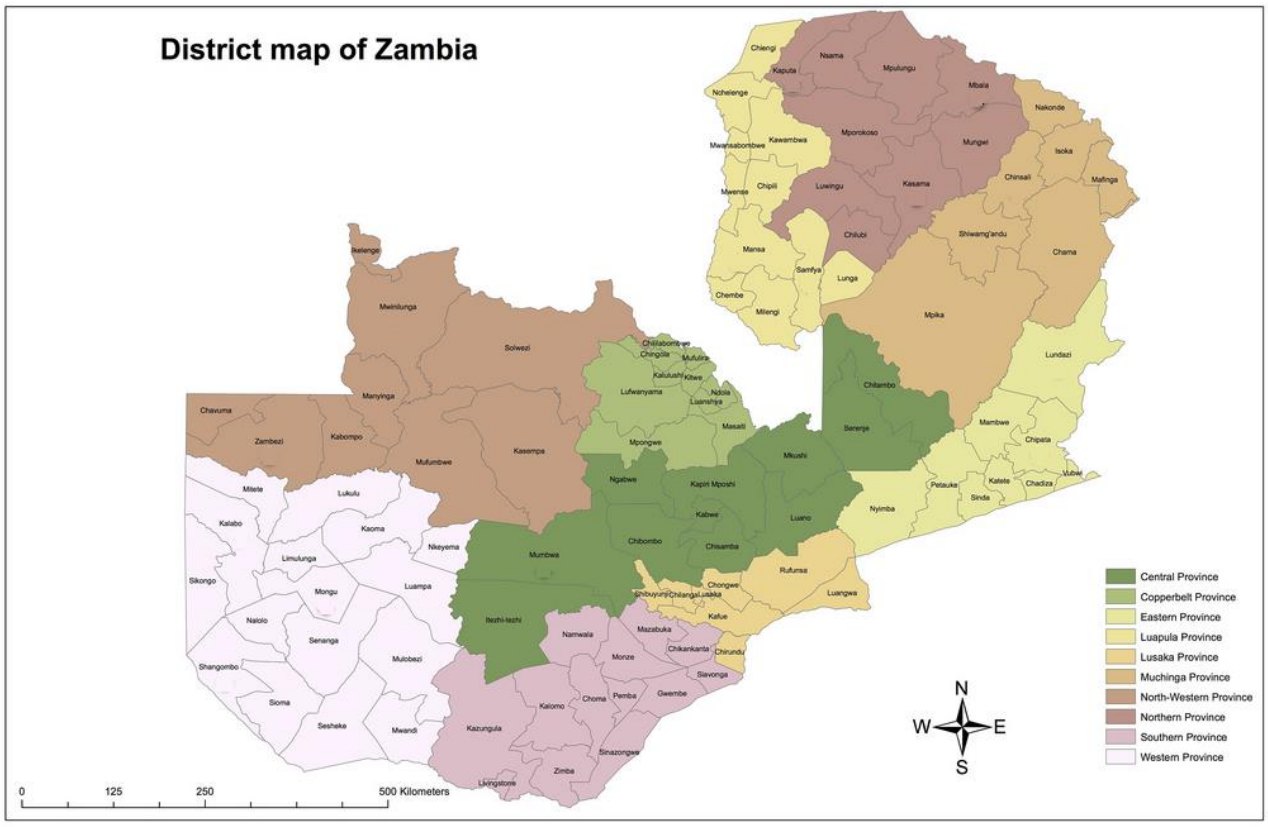
Map:
http://www.ephotopix.com/malawi_region_map.html

Geographical coordinates obtained from Google Earth®

ZAMBIA WOOD BOUNDARY

Zambia is divided into 10 provinces with each province headed by a minister. The PoA will be applicable to entire Zambia. The following are the ten provinces and their co-ordinates[18].

Province	Latitude	Longitude
Central Province	14.3112º S	28.2994º E
Eastern Province	13.8056º S	31.9928º E
Copperbelt	13.0570º S	27.5496º E
Luapula	11.5648º S	29.0460º E
Lusaka	15.3657º S	29.2321º E
Muchinga	14.3160º S	28.0760º E
Northern Province	9.7670º S	30.8958º E
North Western Province	13.0050º S	24.9042º E
Southern Province	16.9621º S	26.4194º E
Western Province	15.9455º S	23.3824º E

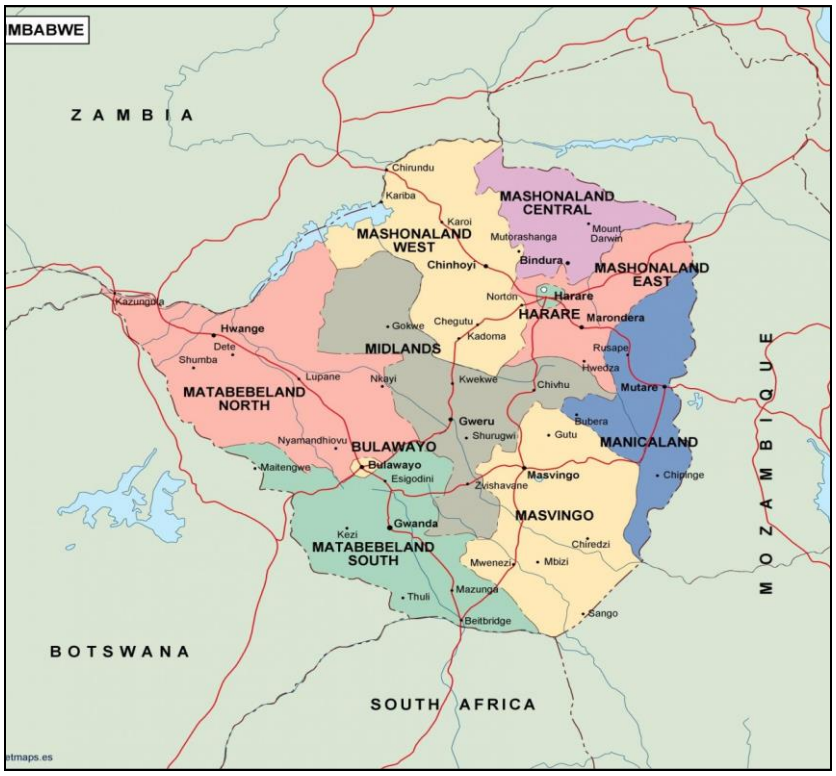


ZIMBABWE WOOD BOUNDARY

[18] Geographical coordinates obtained from Google.

The Republic of Zimbabwe is broken down into 10 administrative Provinces, which are divided into districts and further into wards. The PoA will be applicable to entire Zimbabwe. The following are the ten provinces and their co-ordinates[19].

Province	Latitude	Longitude
Bulawayo	20.1325º S	28.6265º E
Harare	17.8252º S	31.0335º E
Manicaland	18.9216º S	32.1746º E
Mashonaland Central	16.7644º S	31.0794º E
Mashonaland East	18.5872º S	31.2626º E
Mashonaland West	17.4851º S	29.7889º E
Masvingo	20.0792º S	30.8384º E
Matabeleland North	18.5332º S	27.5496º E
Matabeleland South	21.0523º S	29.0460º E
Midlands	19.0552º S	29.6035º E



Political Map of Zimbabwe

A.3. Technologies/measures

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The activities under the proposed SSC-PoA will promote improved cook stoves that result in reduced fuel consumption and emissions due to cooking and heating water in homes. The ICS used in this SSC- PoA have characteristics that improve the efficiency of combustion and thermal transfer to the pot compared with three-stone fires or traditional pot supports.

[19] Google Co-ordinates

An ICS is a single or multi-pot portable or in-situ cook stove with specified efficiency of at least 20% (as per methodology AMS II.G. version 11). Efficiency of the ICS shall be established by a national standard body or an appropriate certifying agent recognized by it, or alternatively manufacturers' specification shall be used – any selection of these tests shall be approved by the CME prior to inclusion of ICS under any CPA. Each CPA implementer shall clearly describe in detail each type of ICS it is implementing in the SSC-CPA-DD. Below is an indicative description of the several types of ICS that could be implemented under CPAs.

For the purpose of this POA, ICS can be classified using the following key characteristics:

1. **Construction material** - Improved Cooking Stoves are commonly made of one or more of the following materials: metal, clay/mud, fired-clay/mud or ceramics and bricks. Classification based on the material helps in selecting an appropriate design on the basis of locally available raw materials, skills for fabrication and necessary production facilities (e.g. centralized/decentralized) in the target area.

2. **Portability** - On this basis, an Improved Cooking Stove can be classified as fixed (in-situ) or portable. Metal and ceramic ICS are normally portable in nature while clay/brick, clay/stone ICS are generally high mass and thus are fixed. Stoves in this category can be further sub-divided into different categories depending on the number of pot holes, e.g., single, double and triple.

Types of ICS: the list of ICS below is indicative of the types of technologies envisaged to be implemented under this POA. It is important to note that several other models of ICS using a combination of the above categories (construction material and portability) may be later implemented under this POA-DD. Specific stoves types will be described for each SSC-CPA

For example, it is intended that the first CPA under this PoA will distribute the EcoZoom Dura improved cook stove. This is a portable improved cook stove developed and prefabricated by EcoZoom. The EcoZoom Dura results in substantially reduced fuel consumption and emissions for conducting cooking and water heating tasks in homes. It improves the efficiency of combustion and thermal transfer to the pot compared with a three-stone fire or traditional pot support by incorporating the combustion chamber that provides an environment conducive to clean and efficient combustion of wood. It substantially reduces wood fuel consumption compared with a three-stone fire or traditional pot support. The photograph above shows the EcoZoom Dura rocket stove. This particular stove burns wood only.

Type	Improved Mud/brick stoves	Improved Metal & Ceramic Stoves
Example	TLC Rocket stove, Plancha Stove etc. 	SSM-S32, WS-2 
Portability	Fixed (in-situ)	Portable
Design	Single pot/multi pot	Usually Single pot

Material	Clay, straw, dung, cement, stone, bricks, and some metal parts with or without chimney	cast iron or clay with metal exterior body, metal/ceramic pot rests and metal grate
Life-time	Based on manufacturer's specification/industry standards	Based on manufacturer's specification/industry standards
Efficiency	Usually in the range of 30%-40%. Minimum efficiency should be at least 20%.	Usually in the range of 30%-40%. Minimum efficiency should be at least 20%.
Annual energy saving from single ICS	Shall not exceed 1.8 GWh_{th}/yr for a single ICS[20].	Shall not exceed 1.8 GWh_{th}/yr for a single ICS[20].

Specific stoves types will be described for each SSC-CPA[21].

A.4. Coordinating/managing entity

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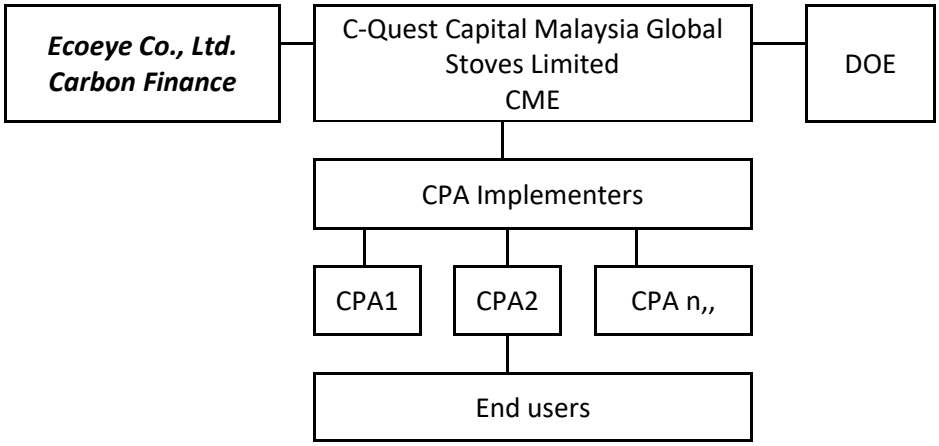
1. Coordinating or managing entity of the PoA as the entity which communicates with the Board

C-Quest Capital Malaysia Global Stoves Limited (CQC) will be Coordinating/Managing Entity of this SSC-PoA and is the entity which communicates with the CDM Executive Board.

2. Project participants being registered in relation to the PoA. Project participants may or may not be involved in one of the CPAs related to the PoA.

C-Quest Capital Malaysia Global Stoves Limited (CQC) will be Coordinating/Managing Entity (CME) of this SSC-PoA and is the entity which communicates with the CDM Executive Board. Ecoeye Co., Ltd. (Ecoeye) will be responsible for financing the implementation of the PoA. CQC and Ecoeye are currently the only project participants to the SSC-PoA (project participants may or may not be involved in one of the component project activities (CPAs) related to the SSC-PoA.



[20] For CPAs consisting solely of microscale CDM units, annual energy saving of a single ICS shall not exceed $60GWh_{th}$.

[21] The stove description above is indicative and does not represent the complete list of options. Also, the technical specifications of the stove may vary from the specifications listed above and will depend on specific stove that the CPA decides to implement but will comply with applicability requirements of the methodology; AMS II.G; version 11.

Fig. Management Structure

A.5. Parties and project participants

Parties involved	Project participants	Indicate if the Party involved wishes to be considered as project participant (Yes/No)
The Netherlands	C-Quest Capital Malaysia Global Stoves Limited (CQC)	No
Republic of Korea	Ecoeye Co., Ltd	No
Republic of Senegal (host)	C-Quest Capital Malaysia Global Stoves Limited (CQC)	No
Republic of Nigeria (host)	C-Quest Capital Malaysia Global Stoves Limited (CQC)	No
Republic of Ghana (host)	C-Quest Capital Malaysia Global Stoves Limited (CQC)	No
Republic of Malawi (host)	C-Quest Capital Malaysia Global Stoves Limited (CQC)	No
Republic of Zambia (host)	C-Quest Capital Malaysia Global Stoves Limited (CQC)	No
Republic of Zimbabwe (host)	C-Quest Capital Malaysia Global Stoves Limited (CQC)	No

A.6. Public funding of PoA

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No public funding from Annex I parties to the United Nations Framework Convention on Climate Change (UNFCCC) are envisaged to be made available for the proposed PoA, or any CPA under the proposed PoA. If public funding from Annex I parties to the UNFCCC is provided, the CME shall confirm that the funding is not diversion of Official Development Assistance (ODA).[22]

SECTION B. Management system

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(a) Definition of roles and responsibilities of personnel involved in the process of inclusion of CPAs, including a review of their competencies;

A clear definition of roles and responsibilities of the parties involved in this POA has been given in Part II Section H.3 below. The CME shall have the competencies to check the features of potential CPAs and ensure that each CPA meets all requirements and eligibility criteria before inclusion in the PoA.

CME Competencies:

C-Quest Capital Malaysia Global Stoves Limited (CQC)

CQC has been a leader in the development of Programme of Activities under the CDM, having developed the CFL lighting scheme-“Bachat Lamp Yojana” POA (CDM Ref. 3223) and

[22] Official development assistance (ODA) is defined in the *OECD Glossary of Statistical Terms* as follows: Flows of official financing administered with the promotion of the economic development and welfare of developing countries as the main objective, and which are concessional in character with a grant element of at least 25 percent (using a fixed 10 percent rate of discount). By convention, ODA flows comprise contributions of donor government agencies, at all levels, to developing countries ("bilateral ODA") and to multilateral institutions. ODA receipts comprise disbursements by bilateral donors and multilateral institutions (*OECD Glossary of Statistical Terms*).

implemented more than 4 CPAs under it (at the time of the validation of this SSC—PoA). CQC is currently the CME for five SSC-PoAs:

POA 1: Distribution of fuel-efficient improved cook stoves in Nigeria
POA 2: Distribution of ONIL-stoves Mexico
POA 3: Distribution of ONIL-stoves Guatemala
POA 4: Distribution of improved cook stoves in Zambia
POA 5: Improved Cookstove Program for Malawi and cross-border region of Mozambique

CQC staff has over 20 years of experience with ICS, having been involved and lead key operations to provide funding through multiple instruments for improved cook stove distribution in different countries. These operations have proven successful and introduced consumers to the opportunity of ICS. CQC staff has established working relationship with major international stove producers and have been involved in the development of registered methodologies and PDDs and POAs for ICS.

(b) Records of arrangements for training and capacity development for personnel;

Key training needs

- Baseline survey[23]: Perhaps the most important single variable in terms of quantifying CERs is the baseline fuel usage in households. The quality of the interviewing was key in getting as accurate a baseline assessment as possible. For this reason, the CME established general guidance for interviewers to follow when conducting baseline fuel surveys in homes. This guidance outlines the questions and manner in which the interview should be conducted in order to get the most accurate estimate possible.

- Monitoring: Training, including that of field personnel, is needed to ensure monitoring activities are conducted effectively. This will include collecting information from a random sample of homes with ICS to determine if the stoves are in-use, as well as a random sample of homes selected for the stove efficiency tests (efficiency tests will be carried out by a third party or trained CPA Implementer personnel using the Water Boiling Test). The procedures to complete this sampling are described in Part II Section I.7.2 of the PoA-DD and meet confidence/precision requirements in accordance with standard for Sampling and surveys for project activities and programmes of activities; version 08 .

- ICS distribution/installation: CPA implementers shall provide evidence of their ability to train technicians/instructors/field staff on ICS assembly, manufacture, installation and distribution in accordance with the type of stove implemented under its CPA. Details on training for ICS distribution/installation are found in Part II Section H.3 of the PoA-DD.

(c) Procedures for technical review of inclusion of CPAs

The CME will undertake the following activities to ensure proper eligibility of the CPAs before they are uploaded for official inclusion into the PoA:

- CME will review each CPA document and methodically go through each and every eligibility/applicability criterion of the PoA to make sure there is no question that the CPA meets each requirement. In cases where there is doubt, the CME will not upload the CPA document until the requirements are met to the CME's satisfaction.
- CME will review the ICS models that are proposed for distribution/installation under each CPA. . CME will review any WBT results to ensure they are in line with established protocols and have been conducted either by certified authorities/researchers or based on

[23] Where applicable

manufacturer specifications.

- CME will review the database/registration procedures to ensure proper recording of the ICS data collection in line with the methodology and PoA eligibility criteria.
- If the CPA implementer is choosing to use a regional or local NRB analysis which is not attached or outlined in the PoA-DD yet, CME will review the study completely to ensure it is as robust in method and data as the NRB study approved during PoA validation. If there are any gaps or problems with the local NRB study, the CPA will not be uploaded for inclusion until the analysis is completed to the CME's satisfaction.
- CME will review all CPA Implementer monitoring procedures to ensure they conform with the Monitoring Plan in the PoA (see Part II Section I.7.2 of the PoA-DD), including stove efficiency (and the specific fuel consumption, where applicable) testing and procedures such as visual inspection and WBT test (efficiency of stove) to check that ICS are still in operation and at what efficiency. As described in Part II section H.3, each CPA Implementer will provide the CME a set of documents (eg. manuals) detailing the training procedures for users and CPA Implementer staff, after sales maintenance, etc, which will be reviewed and approved by the CME prior to CPA inclusion. These documents will be available to the DOE at time of inclusion.
- During the implementation of a CPA, and as necessary, the CME personnel will visit each CPA region to ensure all procedures outlined in the PoA are being followed, particularly on stove registration, and database updating.

(d) A procedure to avoid double counting (e.g. to avoid the case of including a new CPA that has already been registered either as a CDM project activity or as a CPA of another PoA)

Each ICS in each SSC-CPA included in this PoA will be identified by a unique combination of customer name, geographical location, as well as a unique serial number. Quality control and quality assurance procedures will minimize any possible double counting. The serial number will start with an identifier "CQC-SSA" which will allow for a clear distinction between the stoves from this PoA with those of other potential PoAs. Each stove's serial number will be entered into a database that will clearly and unambiguously keep track of the unique stoves in each CPA. Each CPA will have a set of serial numbers so a project participant or verifier can easily determine that any stove identified in any household is affiliated with one – and only one – CPA. No individual serial number can be in more than one CPA, so it will not be possible for one stove to be counted in two different CPAs. In addition, each CPA will be cross-checked with other CPAs in this PoA and with CPAs in any other PoA or in a ICS CDM project activity operating in the country using the UNFCCC, the Gold Standard, and other relevant voluntary carbon schemes to ensure that the CPA is not included in any other PoA, CDM project activity or voluntary carbon project activity.

When a new ICS Registration Card is filled out, or sent via SMS or ICT, the customer will acknowledge that they previously used a three-stone fire or traditional pot support and are not part of any other ICS program in order to be included in the CPA. Registration data collected will be verified by periodic on- going spot-checks. This will ensure that no customers/recipients will be included in a new CPA if they already own an ICS

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

(i) A record keeping system for each CPA under the PoA,

As explained in section "Means of collecting end-users' information" in Part II Section H.3 below, detailed information will be collected from each customer at the time of installation/distribution of the ICS using either electronic or paper-based means, directly by the CPA implementer's field personnel or through partner organizations or independent distributers/retailers. This information, as detailed on the Registration Card, will allow CPA implementers to track each individual ICS and/or household. The information collected by the CPA implementer (or partner organization, distributors/retailers, as appropriate) is transferred to an electronic database which is updated

regularly and shared with the CME – additional details can be found on section "Project Data-Base" in Part II Section H.3. Each CPA will have its own database with a cumulative number of ICSs.

The completed Registration Card (paper or soft copy, if via ICT/SMS) will also constitute an agreement that the household formerly used either a) wood predominantly on a three stone fire or traditional pot support, or b) charcoal predominantly on a traditional pot support, and is willing to transfer rights to carbon assets created by the ICS to the CME (or any affiliate it so designates).

In case a replacement stove is being issued to a customer already registered on the project database, a new registration will not be required. The replacement stove will be recorded in the project database in such a way that it is clear that the replaced stove ceases to be included in the CPA; and the replacement stove is associated with the customer's details as a new ICS, and is included in the CPA as a new ICS with a new serial number.

SMS data will be collated automatically, and backup records will be generated from this data and stored securely by the CPA implementer and the CME. Written registration cards will be entered manually onto the same database and the originals stored securely. In this way there will be both hardcopy (where applicable) and electronic records kept for each ICS installed or distributed in the SSC-PoA.

(ii) The SSC-CPA included in the PoA is not a de-bundled component of another CDM programme activity (CPA) or CDM project activity.

In line with paragraphs 124 (m) and (n) of 'CDM project standard for programmes of activities'; version 02.0, "if the generic CPA consists solely of units that qualify as microscale CDM units as defined in the Methodological tool: Demonstration of additionality of microscale project activities" then conditions to ensure that CPAs that will be included meet the small-scale or microscale thresholds and remain within those thresholds throughout the crediting period of the CPAs is not required. Also, such CPAs need not carry out assessment of the debundling check.

As the generic CPA of the present PoA ~~consists~~ may be described as consisting either of units which qualify as 'microscale CDM units' under paragraph 10 (a) of Tool 19, or units which do not fit into the definition of "microscale unit" according to the said paragraph. In the former case,~~solely of microscale CDM units,~~ CPAs implemented under the PoA are ~~to be included under the PoA are~~ exempted from demonstrating small scale threshold limit or conducting debundling check throughout their crediting period while in the later, the~~.~~ CPAs shall have to adhere to requirements specified under paragraphs 124 (m) & (n) of CDM project standard for programmes of activities; version 02.0

(iii) The provisions to ensure that those operating the CPA are aware of and have agreed that their activity is being subscribed to the PoA;

CPA implementers have the operational responsibility for implementing and monitoring the CPAs under this SSC-PoA. The CME will have legal contracts put in place with CPA Implementers and, as appropriate, with entities assisting with the implementation of the CPA. These legal contracts shall clearly state that the implementation of CPA activities are subscribed to this SSC-PoA.

(f) *Measures for continuous improvements of the PoA management system*

The CME will undertake an annual review of the overall PoA management system, including identifying any problems with stove distribution/installation, stove use once in homes, monitoring

continued stove use and overall database maintenance. This review will ensure that best practices are maintained through the lifetime of the PoA.

SECTION C. Demonstration of additionality of PoA

>>

~~According to (Tool 19): Demonstration of additionality of microscale project activities (version 9.0)~~

Additionality of the PoA has been established in accordance with Methodological Tool: Demonstration of additionality of microscale project activities; version 09.0 for each of the Host countries-

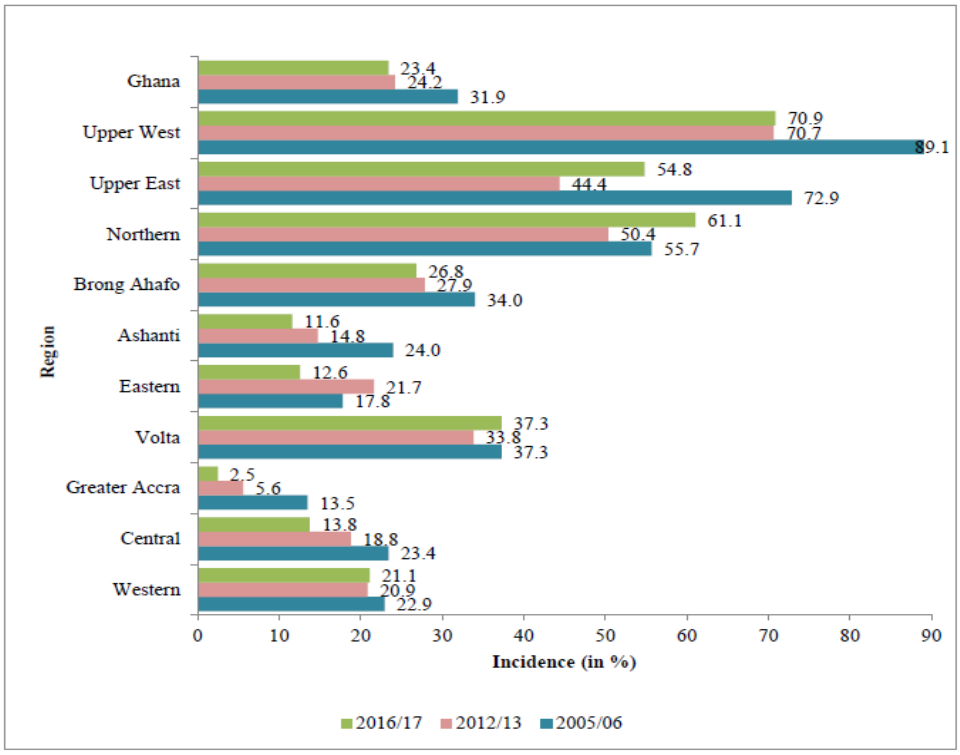
Senegal

According to paragraph 12 of Tool 19 –" Energy efficiency project activities that aim to achieve energy savings at a scale of no more than 20 GWh (60GWh$_{th}$) per year are additional if the geographic location of the project activity is in an LDC/SIDS or SUZ of the host country". Senegal being an LDC, qualifies under paragraph 12 (a) of the Tool. Also, it shall be demonstrated in the CPA that each cookstove unit implemented under it adheres to the energy saving threshold of 60 GWh$_{th}$/yr.

Ghana

Although Ghana attained a middle-income country status in 2010, the 7th Ghana living Standards Survey reveals that out of 10 regions almost half, namely Western, Volta, Northern, Upper East, and Upper West, experienced worsening poverty rates between 2012/13 and 2016/17. The report goes on to state that Upper west has the highest poverty rate among all 10 regions with 71% of the population living below the poverty line of 1,314 Ghanaian Cedi per adult equivalent per year.

Figure 3.3: Poverty incidence (P0) by region, (Poverty line = GH¢1,314)



Poverty Trends in Ghana 2005-2017[24]

Regions other than Upper West where more than 50% of population are below national poverty line are: Upper East-54.8% and Northern-61.1%. According to Ghana Poverty and inequality report, poor live deep in poverty in these regions and that there are a significant number of poor individuals with consumption far below the poverty line, for example, on average people in the Upper West Region live a third below the poverty line[25].

Thus according to paaragarph 10 (b) iii; the above regions qualify as SUZ regions within Ghana as more than 50% of population in these three regions live below the national poverty line[26] as defined in the Ghana Living Standards Survey Report prepared by Ghana Statistical Service.

Therefore, according to paragraphs 12, 14 and 15 of Tool 19, version 09 and the description above, CPAs which qualify the following conditions are additional-

a. Consist of distributed units of less than equal to 20GWh (60GWh$_{th}$) of annual energy saving
b. Implemented in the Upper West, Upper East and Northern regions which have been demonstrated as SUZ areas of Ghana.

Nigeria

Nigeria is Africa's largest economy and one of the fastest growing in the world, yet, more than half of the Nigerian population grapple with extreme poverty. The paradox of growth in Nigeria is that as the country gets richer, only a few benefit, and the majority continue to suffer from poverty and deprivation.

Poverty and inequality in Nigeria have a strong spatial dimension and remains largely a rural phenomenon[27].

According to Nigeria- Sustainable Development Goals (SDG) indicators baseline report (2016), 62.6% of population was under the national poverty line in the assessment year. However, a more recent report by National Bureau of Statistics on Poverty and Inequality in Nigeria -2019, pegs the proportion of rural population living below national poverty line (NPL) at 52.1% (page 5) and going by the World Bank document (referenced above) this figure is only going to increase in the coming years in view of the current economic downturn triggered by declining oil prices and outbreak of Covid-19 Pandemic.

The report gives a brief idea about the way NPL is calculated- by adding food poverty line and cost of non-food basic needs which results in a value equal to 137,430 Naira per person per year. The implication of this value is as follows: the individuals living in households whose per capita annual consumption expenditures is below 137,430 Naira are considered poor by national standards (paragraph 14, page 5).

Thus, in accordance with paragraph 10 (b) (iii) of Methodological tool: Demonstration of additionality of microscale project activities Version 09.0; rural regions of Nigeria can qualify as

[24] Ghana Statistical Service, August 2018.

[25] https://www.unicef.org/ghana/sites/unicef.org.ghana/files/2019-04/Ghana_Poverty_and_Inequality_Analysis_FINAL_3_2016_0_0.pdf

[26] *An upper poverty line of GH¢1,314 per adult equivalent per year: this incorporates both essential food and non-food consumption. Individuals consuming above this level can be considered as able to purchase enough food to meet their nutritional requirements and their basic non-food needs.*

[27] http://documents.worldbank.org/curated/en/636531549879664295/pdf/NIGERIA-Poverty-Briefing-Note.pdf

SUZ as 52% of the population in these regions earn less than the national poverty line which is 137,430 Naira.

Therefore, according to paragraphs 12, 14 and 15 of Tool 19, version 09 and the description above, CPAs which qualify the following conditions are additional-

c. Consist of distributed units of less than equal to 20GWh (60GWh$_{th}$) of annual energy saving

d. Implemented in rural[28] regions which have been identified as SUZ areas of Kano and Kaduna.

Malawi

According to paragraph 12 of Tool 19 –" Energy efficiency project activities that aim to achieve energy savings at a scale of no more than 20 GWh (60GWh$_{th}$) per year are additional if the geographic location of the project activity is in an LDC/SIDS or SUZ of the host country". Malawi being an LDC, qualifies under paragraph 12 (a) of the Tool. Also, it shall be demonstrated in the CPA that each cookstove unit implemented under it adheres to the energy saving threshold of 60 GWh$_{th}$/yr

Zambia

According to paragraph 12 of Tool 19 –" Energy efficiency project activities that aim to achieve energy savings at a scale of no more than 20 GWh (60GWh$_{th}$) per year are additional if the geographic location of the project activity is in an LDC/SIDS or SUZ of the host country". Zambia being an LDC, qualifies under paragraph 12 (a) of the Tool. Also, it shall be demonstrated in the CPA that each cookstove unit implemented under it adheres to the energy saving threshold of 60 GWh$_{th}$/yr

Zimbabwe

A World Bank document estimated that extreme poverty rose from 29% to 34% between 2018-19 fuelled by economic contraction and sharp rise in prices of food and basic commodities. In its Voluntary National Review (VNR) of SDGs For the High Level Political Forum, Zimbabwe quoted 62% of households as living below the national poverty line[29] Poverty is much higher in rural than in urban areas of Zimbabwe as spatial patterns of individual and household poverty follow those of mean levels of consumption. While 60.6 percent of all Zimbabwean households have per capita consumption expenditures below the TCPL, 76.9 percent of rural and 30.4 percent of urban households are deemed poor. According to the latest Poverty, Income, and Consumption Expenditure survey (PICES[30]) data, majority of households in almost all provinces in Zimbabwe are living under the national poverty line with rural poverty being more pronounced and severe than urban poverty.

Zimbabwe	Average Value	TCPL=FPL + Non Food Consumption Expenditure
Food Poverty Line	US$31.27	US$ 70.36
Non Food Consumption	US$39.09	

Calculation of national poverty line[31]

[28] Compliance with this requirement (rural area) shall be demonstrated in specific CPA DD.

[29] https://sustainabledevelopment.un.org/content/documents/15866Zimbabwe.pdf

[30] The Poverty Income, Consumption, and Expenditure Survey (PICES) is the main data source for the compilation of national accounts aggregates and also provides information on living conditions, poverty levels and weights for the consumer price index (CPI).This survey is conducted every 5 years, latest being in 2017 by Zimbabwe National Statistics Agency (ZIMSTAT) under the aegis of Ministry of Finance and Economic Development, Zimbabwe.

[31] Zimbabwe Poverty Report

		Prevalence of (%)		Poverty Indices	
Province	Percent poor households	Poor households	Extremely poor households	Poverty gap index	Poverty severity index
Manicaland	16.5	71.0	27.9	33.0	18.3
Mashonaland Central	12.5	81.6	41.2	42.2	25.1
Mashonaland East	12.6	65.6	22.2	28.8	15.5
Mashonaland West	12.8	71.1	31.6	34.3	20.0
Matabeleland North	6.1	74.3	33.3	36.0	20.6
Matabeleland South	5.3	62.8	17.8	25.6	13.1
Midlands	11.4	63.0	21.8	27.8	15.0
Masvingo	12.8	64.8	20.7	27.6	14.5
Bulawayo	2.1	22.3	0.9	5.3	1.8
Harare Province	7.9	31.1	3.8	9.7	4.1
All Zimbabwe	**100.0**	**60.6**	**21.9**	**26.9**	**14.7**

Source: PICES 2017. The poverty gap and the severity indices are the Foster, Greer and Thorbecke α=1 and α=2 measures, respectively (see Ravallion, 1992 for details). These indices are computed using the upper poverty line (the TCPL). Prevalence of poverty refers to the percentage of households whose consumption expenditures per capita fall below the upper poverty line (the TCPL). Extreme poverty refers to households below the lower line (the FPL).

Thus, in accordance with paragraph 10 (b) (iii) of Methodological tool: Demonstration of additionality of microscale project activities Version 09.0; households in the provinces of Manicaland, Mashonaland Central, Mashonaland West, Matabeleland North, Matabeleland South, Midlands and Masvingo can qualify as SUZ as more than 50% of the population in these regions earn less than the national poverty line which is $ 70.36.

Therefore, according to paragraphs 12, 14 and 15 of Tool 19, version 09 and the description above, CPAs which qualify the following conditions are additional-

e. Consist of distributed units of less than equal to 20GWh (60GWh$_{th}$) of annual energy saving
f. Implemented in households in any of the above mentioned provinces which have been identified as SUZ areas of Zimbabwe.

~~For energy efficiency project activities~~CPAs implemented within geographic boundaries of Ghana, Kano and Kaduna in Nigeria and Zimbabwe which ~~that~~ do not qualify under paragraphs 12 (a) and 12 (b) of the Microscale additionality tool, shall demonstrate additionality in accordance with Figure 2 of Tool 19 which ~~the tool~~ refers to “Tool for demonstration of additionality” or methodological tool “Demonstration of additionality of small-scale project activities” ~~(figure 2 of tool 19)~~ for demonstrating additionality.

~~Thus, additionality for the CPAs implemented under the present PoA shall be demonstrated through Figure 1 in Appendix to methodological tool “Demonstration of additionality of small-scale project activities”; version 13.0.~~

~~According to this figure, for type II projects (energy efficiency) the aggregate CPA size should be less than or equal to the small- scale threshold (180 GWh$_{th}$/yr). If the aggregate CPA size is not less than the small- scale threshold, then the CPAs have to demonstrate that each of the following two conditions are satisfied”~~

~~(i) Each of the independent subsystems/measures in the project activity achieves an estimated annual energy savings equal to or smaller than 600 megawatt hours (this translates to 1.8 GWh$_{th}$/year);~~

~~(ii) End users of the subsystems or measures are households/communities/SMEs.~~

~~If both conditions (i) and (ii) are fulfilled, then such CPAs are additional.~~

~~For the present PoA, the generic CPA consists solely of 'microscale CDM units' as defined by Methodological tool "Demonstration of additionality of microscale project activities"; version 09.0. Therefore, in order to demonstrate additionality, the CPAs are required to show applicability to requirements of condition (i & ii) that is- it shall consist of distributed units where each unit saves less than equal to 1.8 GWh_{th} (600 MWhe) energy per year and end users are households/communities.~~

SECTION D. Start date and duration of PoA

D.1. Start date of PoA

>>
17/01/2012 - the date at which the first Local Stakeholder Consultation was undertaken

D.2. Duration of PoA

>>
28 years 00 months

SECTION E. Environmental impacts

E.1. Level at which environmental impacts analysis is undertaken

>>
Environmental Analysis is done a SSC-CPA level. Given the multi-country nature and the different types/models of ICSs eligible for implementation under this POA, a CPA-level Environmental Analysis is deemed most appropriate.

E.2. Analysis of environmental impacts

>>
No negative environmental impacts have been identified from the proposed PoA, however environmental analysis will be undertaken at the CPA level. CPA Implementer shall confirm whether they are in accordance with host country laws/regulations, and whether an EIA is required.

E.3. Environmental impact assessment

>>
Not applicable. Environmental impact assessment is to be carried out at the CPA level.

SECTION F. Local stakeholder consultation

F.1. Level at which local stakeholder consultation is undertaken

>>
Local stakeholder consultation is done at PoA level. The CPA boundaries (while restricted to the geographic boundaries of a country or region within a country) are not defined geographically but by individual ICS/household location, and may extend across the SSC-PoA project area (but cannot cross borders to other countries). Therefore, a PoA-level Local Stakeholder Consultation in each individual country is deemed most appropriate, covering the whole project area. The environmental, social and economic impacts of the POA will be broadly consistent across CPAs, so the CME do not expect significantly different comments from stakeholders across CPAs. The PPs undertook three PoA level stakeholder consultations, one in each country, and comments

were consistent and positive. The reports for each consultation were provided to the DOE at time of Validation.

F.2. Modalities for local stakeholder consultation

>>

As per the guidelines (3/CMP.1, Annex, paragraph 1(e)), Stakeholders are the public, including individuals, groups or communities affected, or likely to be affected, by the proposed clean development mechanism project activity. Stakeholder comments are invited with respect to this SSC-PoA through a number of processes in each country/region, as follows:

SENEGAL

A public local stakeholder consultation (LSC) was held on 17th January 2012 at the premises of the SEM Fund at "Residence Khouma, Appartment 107, Ouest Foire, Route de l'Aeroport, Dakar, Senegal".

Local stakeholders were invited via multiple methods including: An advert in *Le Sud Quotidien* national newspaper published 16 January 2012; hand-delivered letters of invitation (9 January 2012); a notice placed on the SEM Fund website[32] on 2 January 2012; and emails sent on 11 January 2012.

Key invited stakeholders include:

Ministry of Energy; Ministry of Water and Forests; Ministry of Environment (Designated National Authority); USAID Daka; UNDP Daka; Center of Ecological Studies; Association for the economic, social and cultural advancement of Yoff-Apecsy; women's microfinance collectives; Sustainable and Participatory Energy Management Project (PROGED).

Moreover, a focus group was organized in the village of Mbackombel in the region of Thiès on the 7th April, 2012. The consultation was attended by 27 people, 16 of whom were end-users. The purpose of the focus group was to specifically consult with rural baseline stove users who represent one of the key beneficiaries of this PoA.

GHANA

The consultation forum was held in Accra on 7th May 2012 at the Coconut Groove Regency Hotel. In all 12 participants drawn from Civil Society Organizations, government agencies, research institutions, academia and the press attended the forum. About half the number of the attendees responded to the open invitation advertised in a daily newspaper. The other half were key stakeholders purposefully invited by e-mail to the local stakeholder consultation.

Objectives of the Forum:

The specific objectives of the forum were:

- To present the details of the project to stakeholders
- To discuss the anticipated positive and negative impacts of the project
- To plan mitigation measures with key stakeholders and to
- To obtain comments and feedbacks on the proposed project.

Additionally, the forum provided a platform for knowledge sharing and networking amongst the various organizations present.

At the close of the workshop, participants considered the project as an important step that would go a long way to reduce environmental threats from deforestation in Ghana, reduced CO2 emissions, while also reducing poverty by helping families save on their energy costs while creating a sustainable supply chain and employment.

[32] http://www.sem-fund.org/index.php/en/

NIGERIA CHARCOAL

A public local stakeholder consultation (LSC) was held on 27 April 2012 at the Kakanfo Inn, Ibadan Oyo State, Nigeria. Local stakeholders were invited via multiple methods including: An advert in *The Punch* national newspaper published 24 April 2012; personal visits to charcoal users and those involved in the supply chain as well as SMS reminders, emails and hand-delivered letters of invitation (19-24 April 2012).

Key invited stakeholders include:

The Ministry of the Environment; the Ministry of Health; The Designated National Authority; the Ministry of Women's Affairs; National Environmental Study Action Team Ibadan and Friends of the Environment Lagos.

NIGERIA WOOD

A public local stakeholder consultation (LSC) was held in Kaduna[33] on 19 September 2012. The Kaduna stakeholder consultation was advertised in the "Daily Trust" local paper and was attended by mostly prospective ICS consumers and distributors of the ICS. Relevant stakeholders were invited via invitation letters (hard copies delivered to invitees).

The meeting was chaired by a project representative. Presentations were given outlining the project, as well as the wider issues of woodfuel use for cooking and improved stoves in general. The meeting provided opportunities for attendees to request clarifications, raise any concerns, and express support for the project, as well as submit written comments. All proceedings were documented.

The invited stakeholders represented a national cross section of stakeholder groups. The objective of the meeting was to explain the programme and to seek input on the PoA from relevant stakeholders in the host countries. The full LSC report has been made available to the DOE, and a summary can be found below.

MALAWI WOOD

A public local stakeholder consultation (LSC) was held in Lilongwe on 10 November 2017. Local stakeholders were invited via multiple methods including: Advert in *The Daily Times* and *The Nation* local papers published 13 October 2017, Advert in *Malawi News* local paper published 14 - 20 October 2017 and hand-delivered letters of invitation (13 October 2017).

Key invited stakeholders include:

Malawi Department of Forestry, Malawi Department of Energy, Malawi Department of Environment; the Ministry of Health; Colleague and University, and Initiative for Climate Change Management.

ZAMBIA WOOD

A Local Stakeholders consultation meeting was conducted by C-Quest Capital LLC (CQC) to explain the scope of present PoA and seek feedback of local communities on project design and implementation. Notice for the meeting was published on 2 days- 16/05/2018 and 18/05/2018 in national newspaper (Zambia Daily Mail) to attract as much participation of the local populace as

[33] Address: EE 13 Bida road by Abeokuta, Kaduna

possible. In addition to this, concerned stakeholders were also invited through personal letters/e-mails.

The meeting was held on 14/06/2018 at Cresta Golf View Hotel, Lusaka between 9 to 11:30 A.M. It was chaired by CEO of CQC, who gave a presentation on objectives of the PoA, its description and implementation plan. The meeting was well attended and participants, in particular women, were enthusiastic about the program.

ZIMBABWE WOOD

A public local stakeholder consultation was held on 09 April 2019 at the premises of the CABS Auditorium, Northridge Park, Gun hill, Harare, Zimbabwe and was attended by 33 participants. Stakeholders were invited via multiple methods including advertisement in 'The Herald', a major national daily newspaper, on the 2nd and 6th day of April 2019; e-mail invitations were sent from the Ministry of Energy and Power Development on the 20th of March 2019 with the agenda to 46 different organizations including NGOs, project developers, academia, private and public-sector entities working in related field.

The meeting was opened by Dr. Sosten Ziuku, Director for Energy Conservation and Renewable Energy, Ministry of Energy and Power Development of the Republic of Zimbabwe. This was then followed by a presentation of the project by Ken Newcombe and Jason Steele from C-Quest Capital. The participants were encouraged to ask questions about the project and eventually were required to fill the evaluation form.

F.3. Summary of comments received

>>

SENEGAL:

A sample of comments and questions from the stakeholder consultation undertaken in Senegal (first CPA) on 17 January 2012, in the premises of the SEM Fund, included the following points:

• Question: What are the characteristics of the Ecozoom stove and the quantity of wood that it is used on average? Response: There are three types of possible EcoZoom stoves being considered for the programme[34]: a 25-centimeter-top stove for up to 3-kilo pots; a 32-centimeter-top stove for up to 5-kilo pots; an efficient charcoal-burning stove. Normally, the quantity of wood used for each meal depends on the number of people food is cooked for but, for two kilos of rice and sauce between 1.5 kg and 1.9 kg of wood is used. This is a lot less than the quantity of wood used for two kilos of rice cooked using a traditional three-stone stove.

• Question: What type of partnership will be implemented with local stakeholders? Response: There are two types of partnership envisioned for this programme. The first of one includes locally-based NGOs and organizations for the distribution of the stoves and usage monitoring. The second includes women's groups to help with the identification of potential users as well as recovering of payments.

• Question: What is the impact of the programme on forest management? Answer: the programme is expected to result in a very positive impact on the country's forests. Because all the stoves distributed during this programme will guarantee a higher efficiency rate than traditional three-stone stove and traditional pot support, the quantity of wood or charcoal used per day per household will decrease drastically. As a consequence, a decreased use of woody fuels will have a positive impact on deforestation rate, which will decrease accordingly. In fact, one of the main

[34] The response was in reference to possible examples of what could be the first CPA. The POA is not limited to any specific manufacturer or model/s.

objectives of this programme is to reduce the rate of deforestation in Senegal. Besides the positive effects on forest management, the use of more efficient cook-stoves proposed by this programme will ensure less smoke is released during the combustion of wood or charcoal while cooking. Therefore, the programme will yield a very positive impact on the health of its beneficiaries.

• Question: Who are the investors in this programme? Response: The investor in this programme is C-Quest Capital (CQC), a carbon finance business dedicated to originating and developing high-quality emission reduction projects around the world.

• What's the duration of the programme and its timing? The programme is scheduled to begin validation in the month of April, 2012 while, effectively, stove distribution is tentatively planned to start in October/November 2012[35] after the rainy season in order to avoid logistical problems in relation to seasonal floods. The duration of the carbon crediting period is 7 years, renewable twice, and the stoves are expected to last for at least five years.

• Can we receive more detailed explanation of how households will be able to purchase the stoves? Response: There are seven target regions for this programme. Beneficiaries in each of the seven target regions will be able to purchase the stove after providing evidence that the main stove they use for cooking is a traditional three-stone stove[36] Households will be able to buy the stove at a subsidized price. More specifically, the price is reduced because investors are willing to provide the stoves at a lower cost than the market price in return of carbon credits.

• Question: Can some of the stoves be manufactured in Senegal? Response: Specifically, the EcoZoom stoves are manufactured in China so they have to be imported into Senegal. However, for fixed or built-in stoves, the CME will consider developing a prototype locally if the quality of materials and efficiency rate are consistent with current technology available globally.

• Question: What are the advantages and benefits of this Clean Development Mechanism programme for local populations? Will they obtain any carbon credits? Answer: The beneficiaries of this programme in Senegal will be able to buy efficient cook-stoves at a subsidized price because of the capital investment and sales of carbon credits. Participating households will have to sign a contract with the CME indicating that they cede the rights to the carbon credits generated through the use of the efficient cook-stove to the CME.

GHANA:

- A participant wants to know the extent to which the Ghana Standard Authority would be involved in the cook-stoves project.

Answer: The project would work with the Environmental Protection Agency (EPA) to conduct an environmental impact assessment. Stoves to be promoted under the project would be registered with the Ghana Standard Authority and other nationally authorized entities including the Energy Commission.

- Sizes of the stoves and the market size

Answer: Various stove sizes of stove would be promoted under the project. Steps would be taken to ensure the designs meet the socio-culture needs of the cook. Current estimate shows over 60% of Ghanaian households use charcoal for cooking and heating with most of the cooking done on traditional stoves that are inefficient. There is therefore a very large market for improved cook stoves.

[35] The timing of first stove distribution was tentative. This date shall be rescheduled according to CME or CPA Implementer plans to operate in the region, which are yet to be established.

[36] The response was in reference to the first planned sequence of CPAs. The POA is not limited to replacing three- stone fires.

- Will C-Quest be supporting project implementer with some investment capital?
- **Answer:** These would depend on several factors and would be a business decision between the implementer and C-Quest.

- What types of stoves are going to be used for the project?

Answer: The project aims at providing a variety of stoves onto the market. As such already existing stoves which meet the criteria and standards of improved cook stoves will be used for the project.

- How are the reduced indoor pollution reductions going to be measured?

Answer: Previous works have shown that significant reduction occurs during the production stage as compared to the usage at the consumer level. It is therefore important to isolate measurement at these two stages for effective analysis. The method used to light charcoal should also be considered as this affects the amount of smoke that is also produced.

- Does every CDM project activity implementer have to negotiate independent contracts with C-Quest capital or the contract will be with all implementers?

Answer: Yes, CQC as the CME for the POA will contract directly with implementing counter-parties.

NIGERIA CHARCOAL:

A sample of comments and questions from the stakeholder consultation undertaken in Nigeria on 27 April 2012, at Kakanfo Inn (Ibadan), included the following points:

Question 1

I use a charcoal oven for my business. I've been listening in the hope of hearing something said about it but no mention has been made of it all day.

Response:

There are other plans in the pipeline to address other uses and users of charcoal, in addition to household charcoal improved cookstoves. For now the focus is on meeting the CDM requirement for registering the improved cook stove for household use; and that was the focus for our baseline

Question 2

We handle environmental conflicts in our organization. This project is laudable and needs to be publicized widely, how do we create the awareness for this project? I work with local people and elites as well.

Response

The Global Alliance for Clean Cookstove exists to facilitate this. In March 2012, the Nigerian Clean Cook Stove Alliance was formally launched. This organisation will be responsible for awareness creation across the country and very soon radio jingles will hit our air waves, billboards carrying messages about the improved cook stove as well as other environmental concerns will be in our view lines across the country. The International Centre for Energy, Environment & Development (ICEED) is the seat of the Nigerian Alliance for Clean Cook stoves with offices in Abuja.

Comment

Kerosene is very expensive right now being why people are shifting to less "costly" alternatives of wood and charcoal which has encouraged the felling of more trees thus loosing the canopy provided by the trees. If our electricity supply is stable and regular the pressure on the wood and charcoal will also drop as more women may take to using electricity to cook their food.

There should also be a program to create an industrial version of the stove to serve heavy users like restaurants, hotels, caterers etc.

When the stoves are finally available, the product should be made accessible to cooperative societies and groups. For the marketing of the cook stove, cooperative organizations should be involved as they can very easily introduce the product to their members.

Response

The industrial one is something that is in the pipeline. The moment we are able to determine a baseline and the methodology for this with the UN we'll start looking in that direction. I'm sure too a number of companies would want to put their monies in them to make them available to the users.
The stoves go through a lot of research and series of tests to be able to meet the requirements of the UNFCCC and to be a partner with Partnership for Clean Indoor Air a USEPA project.
Aprovecho has developed a 60 litre cook stove that comes with its own pot attached. The heat is central to the pot that way saving about 90% of the energy generated. That too can better address some of the needs of industrial users but it's very expensive at about $500 per unit.
The value chain is quite extensive. The environment wins, the users win and saves money and do not expose themselves to harmful emissions, the makers of the stove create jobs for the unemployed in the community etc.

NIGERIA WOOD

1. Is the stove being provided alongside with the technicalities that would be required to repair the stove because in Nigeria, a lot of inferior products are imported into the country and there are no provisions for repairing it.
    a. The stove has a five year warranty and if any problem is encountered before the end of those five years, it can be returned to SOSAI.
2. Can the 3 legged local pots be used on fastfire stove?
    a. The pots can be used on the fastfire stove and it will be more comfortable if the legs are cut.
3. In the picture seen during the presentation, the pot was black and to sell these product clean pots should be used. What effect does the fire have on the pots? Would there be profit for the retailers in selling this stove and what would it be?
    a. People all want something that would be easy for them. Our targets are people already using firewood. The stove does not eliminate flames but it reduces smoke up to 70%. The fire darkens pot but not as bad as the local fireplace. There would be profit in it for retailers, but it will be better if the retailers come over to the office to hear what benefit is in it for them.
4. Can it be used for occasion cooking?
    a. The stove can only cook for a maximum of 30 people, so it would not be too convenient to cook in an occasion as the stove is actually targeted at households.
5. Is this meeting holding for marketing reasons?
    a. The meeting is not for only marketing reasons, but criteria that must be met before the UN registers the project.
6. We have seen that only 2 sticks of firewood are being used to cook, how can one regulate the fire if one want to cook at a lower level?
    a. When you are cooking with firewood, there is no any other way to regulate it than to remove the firewood. The stove is targeted at people who already use firewood, they already are familiar with this technique of reducing heat and know all they need to do while using it.
7. What can spoil the stove? Can the stove be washed?
    a. If one handles it roughly by dropping it or hitting, it can break. It can be washed but shouldn't be soaked in water.
8. Does the stove rust during use? After cooking, what next. Should one remove the wood?
    a. No it doesn't rust. Yes you just remove the wood and that is all.
9. Ceramics can break if you pour water on them when they are hot, that means the stove too can break.
    a. There is a metal covering the ceramic of the stove.

10. From your presentation, you said firewood has an effect on our health. Is there any alternative besides wood to be used on this stove?
    No, you can't use any other fuel on this stove, it is reduces the emission only. If it saves 70% of wood then it will save 70% of pollution and smoke.

MALAWI WOOD

A sample of comments and questions from the stakeholder consultation undertaken in Lilongwe on 10 November 2017, included the following points:

Question #1
Mrs Esther Mweso from United Purpose wanted to know how the issues of adoption, maintenance and use of the stoves will be dealt with after the project is phased out and she was also curious about the bad ways of using the stove that compromise its effectiveness and efficiency.
Answer
In response to the first part of the question, Vincent Gondwe from TLC said that TLC works in clusters where villages under certain GVHs in a defined geographical location are targeted and some community members called Community Extension Worker (CEW) volunteer to support the Field Coordinator (FC) in the day to day project interventions. The CEW has appointed by the participating community in TLC activities. The CEW and the FC are provided with all the necessary capacity through trainings. Once the project is phased out, the CEW continues supporting the activities in terms of checking stove correct use, and maintenance while the FC provide the backstopping. The CEW is provided with a push bike to help his/her mobility within the cluster and a monthly bicycle allowance for the maintenance of the push bike and all the financial support comes from the carbon finance on the stove project. Mr Ken Newcombe also added that there is an idea of "women champion" who is chosen in the village and supported through carbon finances to check stove use, maintenance and adoption. The idea is being piloted in Nigeria and will trickle down to Malawi if found effective.
Vincent Gondwe continued to explain the second bit of the question that the bad use include use of too much firewood and big wood fed into the stove which damage the stove chamber. He continued that stove users are provided with training on stove use and firewood management techniques but sometimes children, other than the mother/adult person who received the training, are the ones using the stoves. Therefore there are plans to target pupils in primary schools with training on stove use.
Mr Ken Newcombe from C-Quest Capital and Mr Vincent Gondwe from TLC took advantage to explain how the TLCRS works and introduction of a new design of stick shelf that has wings to control the level of insertion into the stove chamber and production of education materials that should assist in the awareness of the communities on the stove correct use.

Question #2
Mr Fredrick Munthali from NCST wanted to know why stove parts are imported and what are the mechanisms put in place to make sure that in the long run users of the stoves easily access them. He also wanted to know the geographical coverage and scale of the project.
Answer
Mr Ken Newcombe from C-Quest Capital answered that Malawi is not able to produce stove parts from a stronger material to withstand temperatures to which the metal plate is subjected and hence high cost of replacing the parts are incurred. As a trade-off, stove parts of better material are obtained from outside Malawi to reduce the replacement cost and brick work is done locally. He continued to explain that in the long run, there is a thinking of **"stove in a box"** meaning that users who think cannot go back to traditional three stone fire (habituated to TLCRS) can access all the three parts (stickshelf, potskirt and stove top) as a package at a relatively reasonable price (7-9 USD). Mr Vincent Gondwe added that as a solution in the long run, TLC already started **training local artisan** on production of stove parts in designated trading centres in the EPAs so that habituated TLCRS stove users can buy from them at a relatively low cost.

Mr Vincent Gondwe from TLC replied on project coverage and scale by saying that the project will implement 50, 000 improved cookstoves and will target Mwanza, Neno, Nsanje, Dowa and other places where firewood problem is critical.

Question #3

Mr Mark Black from CARE was curious about how the community is receiving the technology considering that TLC was also implementing a mud stove. Mr Black also wanted to know how much it costs for a set of stove parts

Answer

Mr Ken Newcombe from C-Quest Capital replied that a set of stove parts comprising stickshelf, potskirt and stovetop cost 6 to 7 dollars. Mr Vincent Gondwe from TLC added that the reception by communities is quite positive because the current TLCRS has very high efficiency compared to the mud stove and through demonstrations or cooking competitions on TLCRS, three stone fire and mud stove, communities have evidenced the performance of the current technology and are able to make a better choice. Mr Ken Newcombe reiterated on the idea of "**women champion**" as a way to monitor stove use, maintenance and scale up adoption levels.

Question #4

Mr Lawrence Munthali from Self Help Africa wanted to know if there is possibility of companies/organizations implementing cook stoves to migrate into clean projects (carbon projects) and receive support.

Answer

Mr Ken Newcombe from C-Quest Capital said "Yes, the possibility is there. CQC can take all the necessary procedures to get such companies into clean project. TLC can provide all the technical support required."

Question #5

Mr Gift Thole wanted to know if there are any attempts to train people around the city on the use of cookstove in order to curb deforestation considering that much consumption of biomass is happening in the city.

Answer

Mr Ken Newcombe from C-Quest Capital responded that efforts have been made to the extent that villages around 50km radius from the city were trained to grow their own sustainable wood in woodlots. The sustainable rocket wood was being bought by TLC Green at a guaranteed price and delivered door to door through bicycle vendors to people in the city who were provided with an improved cookstove. People in the city have also been encouraged to use pellets other than charcoal.

Question #6

Mr Alfred Chisale from Dziwani Investment wanted to know if the improved cookstove is implemented together with a model kitchen that has a firewood drying rack and cupboard and if there is such a community where other people can go and learn from. He also said he was aware of the project that was supplying firewood in areas around the city as it was going together with chitetezo mbaula. He therefore wanted to know if this supply of firewood stopped.

Answer

Mr Ken Newcombe from C-Quest Capital replied that indeed TLC promotes halfwall kitchens and communities are encouraged to install rocket stove in half wall kitchens or ventilate the existing ones. Mr Vincent Gondwe from TLC added that TLC is taking a deliberate strategy in the implementation of the TLCRS where by farmers with kitchens are purposively targeted and that kitchen requirement is becoming a prerequisite and part of the message during community sensitization meetings. On firewood supply, Mr Gondwe said the supply of wood stopped due to financial implications following the phasing out of the project.

Question #7

Mr Mark Black from CARE took advantage of the meeting to ask Mrs Esther Mweso from United Purpose about how far the promotion of chitetezo is mbaula for lighting homes and charging phones.

Answer
In response, Mrs Esther Mweso reported that the promotion is not concluded, and the research is still underway but the technology has received an overwhelming support from the community.

ZAMBIA WOOD
A sample of questions that was asked during the stakeholder's consultation is presented below.

Question #1
Representative of The World Bank wanted to know about operation and cost per stove for the 60,000 stoves that were in use at present.

Answer
C-Quest Capital clarified that the metal parts for these stoves had been given free of cost to the farmers by CQC. The farmers in-turn contributed by making sun dried -bricks to be used in these stoves for efficient cooking. Wooden moulds for making these bricks was also provided by CQC through COMACO.

Question #2
Another query was whether emission reductions can be claimed if unsustainable collection of wood from forests is reduced.
Answer
In response to the issue of unsustainable forests, it was explained that the emission reduction calculation is approximately 3 metric tonnes of Carbon Dioxide (CO2)/ stove/year which is based on national level baseline calculations. The focus of the project will be areas where there is heavy dependency on firewood for cooking.

Question #3

One of the points raised during stakeholder's consultation meeting was whether there was any effort to replace charcoal stoves even in urban areas?

Answer
it was noted that the way people use charcoal is not sustainable and there was need to improve the technology by moving from charcoal stoves to pellet stoves. There was a contribution from UNZA researcher on this point and the Government of Zambia is working on a charcoal policy and possibly there would be new interventions.

Zimbabwe Wood
A few questions that were asked by the stakeholders along with their response are enumerated below

Question 1
Households in rural areas have poor ventilation. Most of our children have respiratory diseases because of breathing polluted air. The Ministry has mandated to measure indoor air pollution in rural areas.

Answer
Health is a real problem. We recognize our stove decreases the amount of smoke, but it doesn't do eliminate it all together or bring the particulate matter levels down to World Health Organisation standards. We promote with our stoves the use of half-wall kitchens by the household, so there is a cross-ventilation to remove the smoke from the kitchen. In addition, we are experimenting with chimneys in households with chimney built into our stove.

Question 2
How much does the stove cost?

Answer
All up, around USD 30, but cost is mostly logistics. The households get the metal stove parts for free and then spends about 2-man days to make the bricks and build the stoves including the training to do so.

Question 3
I don't think Zimbabwe is like other projects, so I am concerned you are taking a stove from somewhere else that might not fit Zimbabwe. Also, can we locally produce the metal parts in Zimbabwe?

Answer
We have a long history of implementing this stove in rural areas throughout Sub-Saharan Africa and continue to improve the stove based on our experiences in each country. We also continue to improve the metal parts. Currently we are on version 7.0 of the stove parts as we have found that we had to improve the designs and grade of steel to get them to last 7 to 10 years. At present these parts are imported as it's the least cost option. If these parts could be locally produced for similar costs, then that would be an interesting proposition, but as yet we haven't seen this happening in countries that we have worked in.

Question 4
How much carbon will be saved per stove?

Answer
Our expectation is that we would achieve anywhere in the range of 3 to 4 tonnes per stove per year.

Question 5
What is the business case for the end-user for this stove?

Answer
Our experience is time savings from carrying and collecting firewood and faster cooking.

Question 6
Is there any other financial benefit for the user?

Answer
In addition to the stoves, in some cases, where we have the financial ability to do so, we use the carbon revenues to do other community activities to help the locals. For example, in some villages in Malawi we have distributed bamboo seedlings to households so that eventually they will have enough firewood from the bamboo to sustain their energy needs and use in our stoves.

F.4. Consideration of comments received

>>
In general, for Senegal, while comments were very positive, some stakeholders highlighted some challenges that the programme may face during implementation:

1. The stoves are too small for big events like religious ceremonies or weddings. Also, they might not be suitable for big families in Senegal because polygamy is quite common especially in rural areas.

- CME is working with the manufacturer to test a larger stovetop (32 cm as compared to the 26 cm). CME will explore the feasibility of using the larger stove but our in-home tests have shown the 26 cm stove to be acceptable.

2. The programme should prioritise locally-manufactured stoves

- The CME will continue to explore cost-effective ways to either manufacture or assemble

stove parts in Senegal.

In Nigeria Charcoal, the response was very positive. The most prevalent request was a request for an industrial stove. This has been referred to the designers. The other major comment was the need to publicize the program. The response is to work with the Global Alliance.

In Nigeria Wood, all clarifications requested during the stakeholder consultation were addressed to the satisfaction of attendees. No unresolved issues were raised, nor were any misgivings cited. All other comments received were positive in relation to the planned activities. No follow up action was required in respect of the comments received.

In Ghana, stakeholder feedback was generally positive with the following comments:

1. The stoves to be promoted should be made affordable and reasonable and should be vigorously promoted to demonstrate its advantages over the traditional stove.
2. Participants see the project and a good initiative with enormous potential to alleviate poverty since it provides employment for the supply chain players (producers, distributors and retailers).
3. The project should not be limited to only urban areas such as Accra and Kumasi where current improve stove projects seem to be concentrated but should provide enough incentives for expansion to markets beyond the Greater Accra and Ashanti regions.
4. Stakeholders emphasized on project sustainability by ensuring only high quality stoves are distributed so that its efficiency and savings can also be maintained.
5. In order to make carbon funding beneficial to end users, stakeholders suggested that benefits accruing should be invested into the expansion of the market to rural communities.
6. Stakeholders recommended the engagement of research institutions to provide additional inputs in project implementation especially in the areas of monitoring and standards.

In Malawi Wood, all clarifications requested during the stakeholder consultation were addressed to the satisfaction of attendees. No unresolved issues were raised. All other comments received were positive in relation to the planned activities. No follow up action was required in respect of the comments received.

In Zambia (Wood), the participants seemed to be very enthusiastic about the project and none of the attendees raised negative comments about the PoA. Overall there seemed to be much anticipation for cookstoves and the project. Since no negative comment was received, hence no corrective action is required.

For Zimbabwe, in summary there was a considerable amount of positive feedback received in the evaluation forms with several requests for partnerships, with a few main issues being raised such as request to implement the project closely with local communities to determine the appropriate design of the stove and request for the project to consider manufacturing the metal parts locally among other requests.

All clarification requested by local attending stakeholders were addressed during the question and answer period however none of the comments received from stakeholders required any changes to the project design.

SECTION G. Approval and authorization

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Letters of Approval were issued by each of the Parties wishing to the involved in the PoA. These letters authorize the PoA and the CME and have been made available to the validating DOE. These letters are provided along with the PoA-DD.

PART II. Generic component project activity (CPA)

SECTION H. Description of generic CPA

H.1. Title of generic CPA

>>
Distribution of Improved Cook Stoves in Sub-Saharan Africa-[insert country name]-CPA-XXX

H.2. Reference number of generic CPA

>>
9007-XXXX

H.3. Purpose and general description of generic CPA

>>
Each SSC-CPA will involve promotion, distribution and/or installation of affordable improved cook stoves (ICS) to individual households, on a commercial or non-commercial basis.

Implementation and management

CPA Implementers
These are entities which will manage and coordinate the promotion, distribution and/or installation of the ICS in the countries. CPA implementers are also responsible for monitoring activities of the SSC-CPAs. Examples of CPA implementers are: NGOs, religious, environmental, social organizations, farmers associations and private, public or governmental entities. CPA implementers will have an agreement with the CME establishing roles and responsibilities for the successful implementation of the SSC-CPA.

Each CPA implementer will define and establish its distribution channel. Three distribution channels are envisaged to achieve the SSC-POA objective:

- The first channel will leverage community organizations including NGOs, religious organizations and farmers associations.
- The second channel will market directly to consumers through direct distribution/installation in communities, at local market days and other large community events.
- The third channel will utilize existing local, experienced commercial distributors. Each of the distributors will have their own established network of retailers.

Coordinating/Managing Entity
CQC as CME will manage and coordinate activities of the CPA implementers and also provide necessary marketing and promotion assistance to the businesses. The CME will also coordinate the monitoring of the SSC-PoA and all the communications with the UNFCCC Executive Board.

ICS installation/ distribution methodology

In order to succeed in replacing three stone fires or traditional pot support, CPA implementers have the ability to design and distribute/install a variety of types of ICS in the host countries[37]. Below is a description of how CPA implementers may distribute/install ICS according to two different portability categories:

- Portable stoves:

[37] Section A.6 provides additional details on the technology to be implemented under this SSC-PoA.

- No training of technicians/instructors/field trainers will be required for ICS that are imported as finished units;
- CPA implementer shall describe in the CPA how stoves will be distributed;
- If portable stoves are manufactured or assembled locally, CPA implementers shall describe the training materials, type of training and performances test required.

- Fixed ICS: these are usually brick ICS that are generally built on-site, though these could also be metal-based ICS or prefabricated ICSs that need to be assembled/installed on-site. Designs of fixed ICS vary, but can include one or more pot-holes and other accessories (e.g. grate, chimney). CPA implementer installing fixed ICSs shall demonstrate in CPA its capacity and provide specific details on how it will distribute/install fixed stoves, including but not limited to the following:
  - Design the training material for stove technicians/instructors/field trainers as well as for stove users; though the specific trainings material shall be presented per CPA to the CME at the discretion of the CPA Implementer, at a minimum, the CME will require the following:

    1) a Manual for training the technician/instructors/field personal responsible for building the stove, as well as user's manual; 2) documentation on maintenance and after-sales services (if any); 3) description of process for delivery to users any part of the stove which is pre- fabricated (eg. chimney or grate); 4) a complete list of personal responsible for each step of installation and distribution. These materials will be made available for the DOE at CPA inclusion.

    Indicate the type of training (field-based/practical, classroom or both) that shall be conducted;
  - Conduct performance tests in the field to test the technicians/instructors/field trainers' ability to build/install the ICS;
  - Conduct performance tests in the field to test end-users ability to build and repair the ICS (when appropriate);
  - Develop and present a promotion and awareness plan with designated responsible staff

Data Collection and Transfer

Registration Card

CPA implementers must gather the necessary information to identify households using its ICS during the course of the project. To facilitate this process, the CPA implementers will assign a serial number to each ICS or to the household[38]. This number will be recorded in the Registration Card together with the following information (as appropriate and as available):

- Name of ICS user or head of the household
- Address of ICS user or household
- Phone number of ICS user or household
- GPS location of household
- Stove model
- Date of installation/distribution
- ICS serial number
- Retailer/distributer information

Means of collecting end-users' information

[38] In cases where the stove is fixed and a serial number plate is difficult to be assembled to the ICS (eg. mud stoves which are constantly being repaired by users with a new layer of mud), a serial number will be attached to the household, instead of to the stove. For instances where the serial number plate can be attached to the ICS itself, it will be.

CPA implementers shall ensure that the information contained in the Registration Card is collected and transferred to the CME. Collection of end-users' information can be achieved through different means. Below are a couple of options:

- Direct contact: CPA implementer instructs their field team to fill the Registration Card with users' information when selling/installing the ICS. This is initially envisaged to be done manually with ink over a printed Registration Card, but new Information and Communication Technologies (ICT) to increase the efficiency of data collection and data transfer may be applied. One example of these technologies is the personal digital assistant (PDA) - a handheld device that transfers data over the internet.
- Indirect: the users' data (as per Registration Card) may be directly transferred to the CPA implementer via Short Message Service (SMS) also known as text messaging service. In this instance, the CPA implementer will provide the user with instruction on how to submit the SMS to the CPA implementer.

Users' participation on the SSC-POA, transfer of Carbon Rights to the CME and use of baseline stove During the sale/installation of the ICS, the user shall confirm that he/she is a household, the ICS is replacing a three-stone fire or traditional pot support and shall be informed by the CPA implementer of their participation on the SSC-PoA and that CDM finance is being used to fund the ICS. Users shall agree, as per the Registration Card, that it previously did not own an ICS and to transfer the rights of any emission reduction generated by the ICS to the CME/entity approved by CME.

In case of direct contact, the collection of users' information can be achieved by instructing the CPA implementer's sales/field or retailer team members to read out the required information to users (ie that user previously did not own an ICS and transfer of carbon rights) and if possible have users sign the Registration Card or the CPA Implementer sales/field or retailer team members can sign the paper ascertaining that they have read out the clauses. In this instance, CPA implementers shall tick a check- box next to this clause once end-user acknowledges it.

When SMS is used, this clause can be written on the instruction for the user on how to submit the information to the CPA implementer. By sending the SMS, users are acknowledging that it is voluntarily participating in the SSC-PoA, that the ICS is replacing a three-stone fire or traditional pot support and that they agree to transfer the carbon rights to the CME.

Project Database

The information collected by the CPA implementer is stored locally on a CPA Implementer database and all data and updates are transferred regularly to an electronic database managed by the CME.

CPA implementer will have the hard-copy data input into an electronic database – which is managed by the CPA implementer. For information transferred via ICT or SMS, there will be no hard-copy. The electronic data is transferred from the ICT device to the database managed by the CPA implementer.

Similarly, SMS data is transferred directly to the electronic database managed by the CPA implementer. The CPA implementer will give full access to the database to the CME. The database will be backed up to a server managed by the CME regularly throughout the lifetime of the project. The hardcopy of the Registration Card (if applicable) shall be archived by the CPA implementer.

The CME will maintain copies of the database from all of the CPAs and will also act as a backup to CPA implementers' database/s. The CPA implementer personnel entering the data from each ICS will be trained in the basic functions of Excel (or other appropriate software used to build the database) by CPA implementer to reduce the chance for errors. CPA implementer staff will sample and cross-check the data at minimum once every three months by randomly selecting at least 20 database (across all its CPAs) entries and comparing the information in the cells with the information from Registration Cards and SMS texts, ICT uploads (where possible/available). The

database will be sortable by the information collected as per Registration Card and will be made available to the DOE at verification.

The CPA implementer will verify accuracy and completeness and confirm that there is no double entry of serial numbers in the database. The CPA implementer will identify any discrepancy and the correct information will be entered into the database. The CME will oversee and coordinate these measures as necessary.

In case a replacement stove is being issued / sold to a customer already registered on the project database, a new registration will not be required. The replacement stove will be recorded in the project database in such a way that it is clear that the replaced stove ceases to be included in the CPA; and the replacement stove is associated with the customer's details as a new stove, and is included in the CPA as a new stove with a new serial number.

Responsibilities of Operational and Management Entities and CPA Implementer

CQC is the CME for this SSC-POA. CQC or other third parties may act as CPA Implementers. The responsibilities of each party are summarized below.

Entity	Responsibilities
CME	- Review all CPAs to confirm that all eligibility requirements are met before a CPA is proposed for inclusion; - Manage the inclusion of new CPAs with DOE - Maintain copies of the CPAs database and back-up records necessary to stoves sold within each CPA and the SSC-PoA overall; - Provide overall coordination of ICS distribution across the geographical boundary of the SSC-PoA; - Oversee day-to-day operation of the POA; - Coordinate with a DOE to verify emissions reductions from CPAs; and Communicate in all matters with the UNFCCC CDM Executive Board.
CPA Implementer	- Coordinate and manage the market promotion necessary for successful distribution; - Coordinate and manage the implementation of the monitoring plan; - Manage the process of stove selection, stove testing, and stove use surveys in the field on designs agreed with CME - Develop and undertake stove distribution, installation and after sales service systems - Develop and maintain a stove tracking and monitoring and reporting system with a high level of data integrity; - Maintain an accurate database of stove location for verification and issuance of carbon credits under a design agreed with CME; - Keeping all records necessary to verify sold stoves within each CPA; - Implement and oversee day-to-day operation of the Programme, including ensuring users of the stoves are aware of how they should be used; - Tracking stoves to end users and verifying use; - Facilitate the field work of commissioned DOEs for inclusion and verification services - Supervise and provide training to local personnel for monitoring and stoves distribution: • Organize training sessions • Distribute training materials

Local partners will be required to conform with CPA implementation and monitoring systems designed by CME under services agreements signed with CME which will cover the above mentioned role and responsibilities.

Location and scale

CPAs will be defined as the sum of identified locations of in-use ICS installed or distributed to consumers previously using three stone fires or traditional pot supports, based on the detailed registration record described above (including ICT/SMS data as applicable). The sum of the location of these ICS will define the spatial boundary of the SSC-CPA, which in turn will fall entirely within the geographical boundary of the SSC-PoA and within a single country or region included in the PoA specific to the fuel- type of each CPA (specified in Section A.7 of each CPA-DD)".

The generic CPA is small scale and may include either of the following

i. CPAs applying microscale threshold at unit level rather than at aggregate CPA level and consisting of 'microscale CDM units' as defined by paragraph 12 of Methodological Tool: Demonstration of additionality of Microscale project activities; version 09

~~i.~~ii. CPAs applying small scale threshold at aggregate CPA level.

Each CPA in option (i) will define the stoves based on the specific model and context, such that each ICS is under the microscale energy savings threshold of ~~1.8~~ 60GWh$_{th}$/year. Compliance of such CPAs with small scale threshold at aggregate level is not required. For CPAs falling under option (ii) the aggregate CPA size should be demonstrated to be less than or equal to small scale limit of 180 GWh$_{th}$/yr.

The annual energy saving of an ICS in any one CPA will be dependent on the biomass saved by each ICS ($B_{y,saving}$) in one year and shall be calculated in the following manner:

$= (NCV_{biomass} * B_{y,savings})$[39]

Where:

$NCV_{biomass}$	Net calorific value of the non-renewable woody biomass that is substituted (IPCC default for wood fuel, 0.015 TJ/tonne)
$B_{y,savings}$	Total woody biomass that is saved in tonnes in one year (*y*)

H.4. Technologies/measures

>>

The technology/measure to be employed and implemented by the corresponding CPAs is the improved cook stoves with specified efficiency of at least 20%. The description of ICS to be implemented is provided under Part I Section A.3.

	Improved Mud/brick stoves	**Improved Metal & Ceramic Stoves**
Example	TLC Rocket stove, Plancha Stove etc. 	SSM-S32, WS-2 
Portability	Fixed (in-situ)	Portable

[39] Please refer to Section I.6 below for calculation of $B_{y,savings}$

Design	Single pot/multi pot	Usually Single pot
Material	Clay, straw, dung, cement, stone, bricks, and some metal parts with or without chimney	cast iron or clay with metal exterior body, metal/ceramic pot rests and metal grate
Life-time	Based on manufacturer's specification/industry standards	Based on manufacturer's specification/industry standards
Efficiency	Usually in the range of 30%-40%. Minimum efficiency should be at least 20%.	Usually in the range of 30%-40%. Minimum efficiency should be at least 20%.
Annual energy saving from single ICS	Shall not exceed 1.8 GWh_{th}/yr for a single ICS[40].	Shall not exceed 1.8 GWh_{th}/yr for a single ICS[41].

Specific stoves types will be described for each SSC-CPA[42].

SECTION I. Application of methodologies and standardized baselines

I.1. References to methodologies and standardized baselines

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The approved small-scale baseline and monitoring methodology used is AMS II.G, version 11, *Energy Efficiency Measures in Thermal Applications of Non-Renewable Biomass*.

I.2. Applicability of methodologies and standardized baselines

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The SSC-PoA complies with applicability criteria under AMS.II.G. (version 11) as described below:

Introduction of efficient thermal energy generation units utilizing non-renewable biomass (e.g. complete replacement of existing biomass-fired cookstoves or ovens or dryers with more efficient appliances), or retrofitting of existing units reducing the use of non-renewable biomass for combustion

AMS II. G Requirement	SSC-CPA Compliance Justification
The methodology is applicable to the introduction of single pot or multi pot portable or in-situ cookstoves with rated efficiency of at least 20 per cent.	Cookstoves distributed under the PoA shall have minimum efficiency of 20% as determined in accordance with 'Data/parameter Table 12' of the applied methodology. This eligibility criterion is included in point no 11 under section K below.
The aggregate energy savings of a single project activity shall not exceed the equivalent of 60 GWh	As theFor generic CPAs consists solely of microscale CDM units as defined by under

[40] For CPAs consisting solely of microscale CDM units, annual energy saving of a single ICS shall not exceed 60GWh_{th}.

[41] For CPAs consisting solely of microscale CDM units, annual energy saving of a single ICS shall not exceed 60GWh_{th}.

[42] The stove description above is indicative and does not represent the complete list of options. Also, the technical specifications of the stove may vary from the specifications listed above and will depend on specific stove that the CPA decides to implement but will comply with applicability requirements of the methodology; AMS II.G; version 11.

per year or 180 GWh thermal per year in fuel input.	paragraph 12 of Tool 19, each ICS under the PoA shall not exceed the microscale threshold [43] for energy saving per year. For CPAs not qualifying as consisting of microscale CDM units defined under paragraph 12 of Tool 19, the aggregate energy savings shall not exceed the limit of 180 GWh_{th}/yr. This is also included in point no 3 under eligibility criteria for inclusion of CPA, section K, below.
Non-renewable biomass has been used in the project region since 31 December 1989, using survey methods or referring to published literature, official reports or statistics.	As demonstrated in Appendix 3 below, non-renewal biomass has been used in the project region since 31st December 1989.
For cases where the biomass is sourced from renewable sources, the project participants should use a corresponding Type I methodology.	This criterion is not applicable.
If the project device requires a specific fuel for this device (e.g. briquettes, pellets, woodchips), the consumption of the fuel should be monitored during the crediting period.	This criterion is not applicable.
The CDM-PoA-DD/CPA-DD shall explain the proposed method for distribution of project devices including the method to avoid double counting of emission reductions such as unique identifications of product and end-user locations (e.g. programme logo).	Each ICS under the PoA shall be identified through an alpha numeric nomenclature to be fixed to the ICS or in form of registration card to be given to the beneficiary. Specific CPA DDs to include explanation on proposed method of distribution of project devices including method to avoid double counting. This has also been discussed under points 6 & 16 of section K below.
The CDM-PoA-DD/CPA-DD shall also explain how the proposed procedures prevent double counting of emission reductions, for example to avoid that project stove manufacturers, wholesale providers or others claim credit for emission reductions from the project devices.	The stove manufacturers, wholesale providers, end users shall sign an undertaking stating clearly that the CME or an entity authorized by it shall be the sole owner of the CERs arising from the project. This is further discussed under point 14 of Section K below.

I.3. Application of multiple methodologies

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Not applicable. Only one small scale methodology is applied under this PoA.

I.4. Project boundary, sources and greenhouse gases (GHGs)

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[43] ~~Please refer to Section C for the energy saving threshold limit of 1.8 GWh_{th}/yr (600 MWhe)~~60 GWh_{th}/year for a single ICS

Source		GHG	Included?	Justification/Explanation
Baseline	Combustion of non-renewable biomass for cooking (3-Stone fire or traditional pot support)	CO_2	Yes	Major source of emissions
		CH_4	No	Minor source of emissions and limited data available
		N_2O	No	Minor source of emissions and limited data available
Project activity	Combustion of non-renewable biomass for cooking (ICS	CO_2	Yes	Major source of emissions
		CH_4	No	Minor source of emissions and limited data available
		N_2O	No	Minor source of emissions and limited data available

I.5. Establishment and description of baseline scenario

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According to the methodology, it is assumed that in the absence of the project activity, the baseline scenario would be "the projected use of fossil fuels to meet similar thermal energy needs as those provided by the project devices".

In line with paragraph 288 and 289 of CDM project standard for programmes of activities; version 02.0; modalities to calculate GHG emission reductions or net anthropogenic GHG removals that result from the baseline scenario has been reassessed in accordance with existing national and/or sectoral policies as well as the latest version of applied methodology.

Furthermore, data and parameters used for determining the original baseline, that were determined ex ante and not monitored during the PoA period and which are no longer valid have been updated according to paragraph 291, CDM project standard for programmes of activities; version 02.0

Assessment of the validity of the data and parameters as per Tool 11

- Default IPCC values – Default IPCC values, other than ones defined in the methodology, have not been used and the ones specified in the latest version of the methodology are updated values.
- Emission factors, values and benchmarks- These have been updated in line with the latest version of methodology.
- The current baseline emissions have been updated for the subsequent crediting period Please refer to Section I.6. for details.
- Data and parameters that were fixed ex-ante and which were not monitored have been updated in accordance with the requirements of the applied methodology AMS II.G, version 11. Please refer to Section I.6.2 for details.

I.6. Estimation of emission reductions

I.6.1. Explanation of methodological choices

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The choice of methodology for a typical SSC-CPA will be AMS II.G Version 11. The activities of each SSC-CPA will entail the distribution/installation of improved cooking stoves, which result in energy efficiency improvements to some application of non-renewable biomass, as required by AMS II.G Version 11.

In the absence of the project activity, for the purposes of emissions reductions, the baseline is assumed to be the projected use of fossil fuels to meet similar thermal energy needs as those provided by the project devices. In this case, as per AMS II.G Version 11, the default emissions factor of 73.2 tCO2/TJ for Sub Saharan Africa shall be applied. In addition, Version 11 allows a

default leakage adjustment factor of 0.95 to be applied to $B_{y,savings,i,j}$ to account for leakages. This PoA will also use this default. In order to account for leakages occurring as a result of Project activities switching from baseline device using firewood to efficient project device using charcoal, a default value of 0.030 t CH4/t charcoal shall be used in accordance with methodology "AMS-II.G, paragraph 40 & 41"[44].

Because of the nature of traditional baseline stoves in use in the countries part of this POA – including three stone fires and traditional pot supports – it is not possible to ensure that these are disposed of.

Therefore, this PoA will monitor the continued use of baseline stoves amongst users of ICS that are in operation in order to ensure that the baseline stoves (μy) usage is accounted for in the calculation of emission reduction in accordance with Equation 2 of AMS II.G Version 11.

According to the methodology, $B_{y,savings}$ may be calculated in a number of ways and this PoA will allow the use of Option 3 that is Water Boiling Test in CPAs under this POA. Option 2 is excluded because of the need to perform a Kitchen Performance Test, which will not be used in this PoA. Option 4 is excluded because WBTs tend to be more accurate and easier to implement than controlled cooking tests, and WBTs can use a default for the original efficiency (thus efficiency tests only have to be conducted once on ICS). In all instances, the possible variation in performance of stoves of different vintages will be accounted for in calculating $B_{y,savings}$.

This PoA will use equations 7 and 8 of methodology AMS-II.G version 11.0. A detailed explanation of how emissions reductions are estimated is included in section B.6.3 of Part II of this document.

Under option 3; the CPAs can use either equation 7 or equation 8 for estimating $B_{y,\ savings}$. The choice of option shall be stated clearly in the CPA as per paragraph 50 of applied methodology.

[44] Equation 2 of methodology AMS.III.B.G and included in Section I.6.3 of the document.

I.6.2. Data and parameters fixed ex ante

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

Data/Parameter	**$B_{old,HH}$**
Data unit	Tonnes / household / year
Description	Annual quantity of woody biomass that would have been used in the household in the absence of the project activity to generate useful thermal energy equivalent to that provided by the project devices
Source of data	Based on the historical data or a sample survey conducted as per the latest version of "sampling and surveys for CDM project activities and programme of activities". If the monitoring period is shorter or longer than one year, the result may be extrapolated for the monitoring period.
Value(s) applied	This value shall be declared in CPA-DD
Choice of data or Measurement methods and procedures	Calculated from historical data/sample survey.
Purpose of data	Calculation of baseline emissions
Additional comment	none

Data/Parameter	***$B_{old,i,j}$***
Data unit	Tonnes per annum
Description	Annual Quantity of woody biomass used in the absence of the project activity to generate useful thermal energy equivalent to that provided by the project device type i and batch j.
Source of data	$B_{old,HH} \div N_{d,HH}$
Value(s) applied	Variable.
Choice of data or Measurement methods and procedures	It is envisaged that only a single project stove will be distributed/installed per household hence the value of $B_{old,i,j}$ is assumed to be equal to the value of $B_{old,HH}$, however actual value will depend on $B_{old,HH}$ and monitored parameter $N_{d,HH}$
Purpose of data	Calculation of baseline emissions
Additional comment	none

Data/Parameter	***$f_{NRB,y}$***
Data unit	Fraction
Description	Fraction of woody biomass saved by the project activity in year y that can be established as non-renewable biomass
Source of data	Independent third party reports or inhouse calculation as per Tool 30: Calculation of the fraction of non-renewable biomass; version 02.0.
Value(s) applied	Variable - country or region specific (to be declared ex ante in CPA DD)
Choice of data or Measurement methods and procedures	Calculated as per "Tool 30: calculation of the fraction of non-renewal biomass"; version 2.0
Purpose of data	Calculation of baseline and project emissions
Additional comment	none

Data/Parameter	***$NCV_{biomass}$***
Data unit	TJ/tonne

Description	Net calorific value of the non-renewable woody biomass that is substituted
Source of data	IPCC default
Value(s) applied	0.0156
Choice of data or Measurement methods and procedures	AMS II.G, version 11
Purpose of data	Calculation of baseline and project emissions
Additional comment	NA

Data/Parameter	$EF_{projected\_fossilfuel}$
Data unit	tCO_2/TJ
Description	Emission factor of the fossil fuel projected to be used for substitution of non-renewable biomass.
Source of data	Default value for Sub-Saharan Africa as provided in Version 11 of AMS IIG
Value(s) applied	73.2
Choice of data or Measurement methods and procedures	Regional default value of fossil fuel emission factor given in AMS II.G; version 11.
Purpose of data	Calculation of baseline and project emissions
Additional comment	NA

Data/Parameter	***L***
Data unit	Leakage
Description	Leakage adjustment Factor
Source of data	Default value as per AMS II.G; version 11
Value(s) applied	0.95
Choice of data or Measurement methods and procedures	A net to gross adjustment factor (0.95 default) is applied in order to adjust B_{old} to account for leakages as per paragraph 39 of the AMS II.G, version 11 methodology.
Purpose of data	Calculation of baseline and project emissions
Additional comment	NA

Data/Parameter	***SMG***
Data unit	t CH_4/t Charcoal
Description	Specific methane generation for the baseline charcoal generation process in the year y
Source of data	Default value as per AMS II.G; version 11
Value(s) applied	0.030
Choice of data or Measurement methods and procedures	To account for emissions related to charcoal production in accordance with paragraphs 40 and 41 of AMS II.G; version 11.
Purpose of data	Calculation of leakage related to charcoal production
Additional comment	Applicable only for CPAs replacing firewood consuming baseline stoves with efficient charcoal stoves.

Data/Parameter	GWP_{CH4}
Data unit	t CO_2e/t CH_4
Description	Global warming potential of methane
Source of data	GHG protocol

Value(s) applied	25[45]
Choice of data or Measurement methods and procedures	To account for emissions related to charcoal production in accordance with paragraphs 40 and 41 of AMS II.G; version 11 which direct to AMS III.BG, version 03 for its estimation.
Purpose of data	Calculation of leakage related to charcoal production
Additional comment	Applicable only for CPAs replacing firewood consuming baseline stoves with efficient charcoal stoves. Ex ante value to be fixed for entire crediting period.

I.6.3. Modalities for ex ante calculation of emission reductions

>>

Emission reductions for each SSC-CPA will be calculated according to the following formula:

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

where

- i - Indices for the situation where more than one type of project device is introduced to replace the pre-project devices.
- j - Indices for the situation where there is more than one batch of project device
- ER_y - Emission reductions during year *y* in t CO_2e
- $ER_{y,i,j}$ - Emission reductions by project device of type *i* and batch *j* during year *y* in t CO_2e
- LE_y - Leakage emissions in the year *y*

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

where

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

For emission factor of fossil fuel displaced by the project stoves, default value of 73.2 t CO2/TJ which is the emission factor for Sub-Saharan Africa has been used.

The value of f_{NRB} has been calculated using option 1 that is ex ante and shall be fixed for entire crediting period.

Calculating $B_{y,\ savings}$

According to the AMS II.G (version 11) methodology, $B_{y,savings}$ may be calculated in a number of ways and this PoA will allow the use of Option 3.inCPAs.

[45] https://www.ghgprotocol.org/sites/default/files/ghgp/Global-Warming-Potential-Values%20%28Feb%2016%202016%29_1.pdf

Option 3

Under Option 3, either of these two equations may be used by the SSC-CPA, however the choice of option shall be stated clearly in the CPA-DD and shall remain fixed for entire crediting period.

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

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

where

$B_{old,i,j}$	-	Annual quantity of woody biomass that would have been used in the absence of the project activity to generate useful thermal energy equivalent to that provided by the project device type *i* and batch *j* .
$\eta_{new,i,j}$	-	Efficiency of the project device *i* and batch *j*
$\eta_{old,i,j}$	-	Efficiency of the old devices being replaced by project devices of type *i* and batch *j*
$B_{y=1,new,i,j,survey}$	-	Quantity of woody biomass used by project devices in tonnes per device of type *i* and batch *j*

$$B_{old,i,j} = B_{old,HH} \div N_{d,HH}$$

where

$B_{old,HH}$	-	Annual quantity of woody biomass that would have been used in the household in the absence of the project activity to generate useful thermal energy equivalent to that provided by the project devices (tonnes/household/year)
$N_{d,HH}$	-	Number of project devices per household (number)

Leakage to account for charcoal production[46]

$$LE_{Charcoal\ production} = Q_{CC} \times GWP_{CH_4} \times SMG \times f$$

where

Q_{CC}	-	Quantity of charcoal used in project device in a year in tons
GWP_{CH_4}	-	Global warming potential of CH_4 applicable to the crediting period
SMG	-	Specific methane generation for charcoal generation process in year y (t CH_4/ton charcoal). a default value of 0.030 t CH_4/t charcoal may be used.
f	-	A fraction attributed to project charcoal production technology, use a default value of 0.1[47]

For each SSC-CPA, certain parameters indicated in the methodology for the calculation of emissions are fixed. Default values have been selected for the following parameters:

1. $NCV_{biomass}$ The IPCC default value is selected, as indicated in the methodology (0.0156TJ/tonne)

[46] Applicable for CPAs replacing firewood baseline stove with efficient charcoal stove in accordance with paragraphs 40 & 41 of AMS II.G. Equation referenced from Equation no 2 of AMS III.BG, version 03.0.

[47] AMS III.BG; version 03.0

2. $EF_{projected\_fossilfuel}$ – Default value as per applied methodology (73.2 t CO2/TJ)
3. The 0.95 leakage adjustment factor is applied in line with AMS II.G. version 11
4. For conversion from charcoal to wood, project participants can use an IPCC default of 6:1. For example, if a baseline charcoal survey found an average of one tonne of charcoal, for the calculation of B_{old} this would be equivalent to six tonnes of wood.
5. Default value of 0.030 t CH4/t charcoal for specific methane production per ton charcoal production is applied in line with AMS II.G. version 11.

The following parameters shall be assessed by experts (third party/inhouse), using appropriate assessment techniques.

1. $f_{NRB,y}$ The fraction of woody biomass saved by the project activity that can be established as non-renewable biomass.
2. B_{old}, The average quantity of woody biomass used per stove in the absence of the project in three stone fires or traditional pot supports.

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I.7. Monitoring plan

I.7.1. Data and parameters to be monitored

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

Data/Parameter	***Z***
Data unit	Number of stoves sold/distributed
Description	Total number of stoves sold and registered in the Project Database Records
Source of data	Project Database records
Value(s) applied	To be mentioned in individual SSC-CPA DDs.
Measurement methods and procedures	Detailed sales information will be collected for each customer, either using electronic or paper-based means. On electronic means, the data will be collected by SMS (i.e. mobile phone 'short message service' text) or Information and Communication Technologies ('ICT' – such as PDAs). Information that is entered into the database includes the name of the customer, address/ description of location, contact telephone number(s), unique serial number of the stove, retailer ID, and date of purchase. Sales information submitted via SMS/ ICT will automatically enter the database. Written registration cards will be entered manually into the same database. The unique serial number of each stove sold will correspond to a CPA. The date that the stove is registered in the database shall be used for determining vintage of the stove.
Monitoring frequency	continuously until the database is frozen for a CPA
QA/QC procedures	Project distribution staff will spot-check end-users to verify that information submitted was factual.
Purpose of data	cross checking
Additional comment	None

Data/Parameter	$\mathbf{N_{y,i,j}}$
Data unit	Quantity
Description	Number of project devices of type i and batch j operating in a year.
Source of data	sample survey
Value(s) applied	to be monitored at CPA level
Measurement methods and procedures	The proportion of sampled ICS found to be in operation during each monitoring period will be applied to the total number of stoves for each CPA when calculating emission reductions. Sampling standard shall be used for determining the sample size to achieve 95/10 [48] confidence precision. A discount shall be applied based on the percentage of devices operational as determined by the sample survey, e.g. if survey shows that 10% of the devices is non-operating, an adjustment factor of 0.9 shall be applied to number of project devices commissioned in a batch. Separate samples shall be taken for each batch.
Monitoring frequency	Annually/biennially

[48] For CPAs not qualifying under paragraph 12 of Tool 19, the requirements of the applied methodology shall apply- 90 % confidence interval and 10% margin of error for annual sampling and 95% confidence interval and 10% margin of error for biennial sampling.

QA/QC procedures	The unique reference number of each stove shall be logged in the monitoring database showing the total number of stoves. Data from the sampling plan will be collected in each monitoring period by trained project staff and applied in the emissions reduction calculations. Internal cross-checks by the CME or CPA implementer will be undertaken as QC.
Purpose of data	Calculation of baseline emissions
Additional comment	See Part II Section I.7.2 of the PoA-DD for more detail on monitoring procedures

Data/Parameter	$\eta_{new,i,j}$
Data unit	Fraction
Description	Efficiency of the device type i and batch j being deployed as part of the project activity
Source of data	Efficiency tests in each monitoring period
Value(s) applied	CPA-specific.
Measurement methods and procedures	Efficiency may be determined using any of the following 1. The efficiency of the project devices shall be based on certification by a national standards body or an appropriate certifying agent recognized by that body; 2. Alternatively, manufacturer specifications on efficiency based on water boiling test (WBT) may be used as per directives given in methodology. 3. If the efficient cookstoves are produced by a manufacturer with a recognized management system in place (e.g. ISO certification) to ensure that the individual equipment produced do not vary beyond the range of acceptance limits (e.g. characteristics such as materials, critical dimensions). Directives given in the methodology with respect to simplified approach may be used.
Monitoring frequency	• Recorded at the time of stove installation/distribution. • In the subsequent years after stove installation, the efficiency of project stoves to be estimated annually in accordance with options (b), (c) or (d) under paragraph 37 of the applied methodology. Choice of option to be mentioned in the CPA DD
QA/QC procedures	Efficiency tests to be carried out in accordance with national or international standards / guidelines by an authorized agency.
Purpose of data	Calculation of baseline and project emissions

Additional comment	Loss in efficiency of project devices due to ageing shall be assessed in accordance with paragraph 37 of the applied methodology. The CPAs developed under the PoA can use either of the options stated below for determining drop in efficiency of the project devices. (b) Manufacturer of project devices shall confirm with technical justification based on certification by a national standards body or an appropriate certifying agent recognized by that body that no decrease in efficiency of project device is envisaged during the crediting period; or (c) Determine the rate of efficiency drop for a representative sample of the first batch of project device i in year y and assume that same rate of loss in efficiency applies to all other batches. In other words, it may be assumed that the degradation of efficiency measured in a representative sample of the first batch of project devices i apply to all subsequent batches. The efficiency of the project devices in the first batch has to be monitored annually through representative samples and this rate of loss in efficiency may be applied correspondingly to all batches; (d) Determine the loss in efficiency annually from a representative sample of each batch and use the actual loss rate that is measured. CPA DD to clearly mention the option selected.

Data / Parameter:	μ_y
Data unit:	Fraction
Description:	Adjustment to account for any continued use of pre-project devices during the year *y for CPAs using* $B_{old,i,j}$ *for calculation of* $B_{y,savings}$
Source of data:	Survey of a representative sample to determine the ongoing baseline stove use will be undertaken using the sampling approach outlined in Part II section I.7.2 of the SSC-PoA-DD
Value(s) applied	To be monitored at CPA level
Measurement methods and procedures:	The CPAs can use either of the options provided in the applied methodology, AMS II.G, version 11 (Data/Parameter Table 10) for determining the value of μ_y.
Monitoring frequency:	Annual/biennial
QA/QC procedures:	Data for this parameter will be collected by trained project staff members. Internal cross-checks by the CME or CPA Implementer will be undertaken as QC.
Purpose of data	Calculation of baseline and project emissions
Additional comment:	If equation 8 under option 3 (WBT) is used combined with direct measurement of Biomass new, then $\mu_{y,i,j}$ (parameter 2) may be assumed as 1.0. When the data loggers are used, the days when only project devices or only pre-project devices are used will be attributed accordingly. The days where both devices have been used, if the data loggers are able to detect and record the time each device has been used (e.g. in hours), the share in the total duration of utilization will be used to attribute a fraction of this day to one or to the other device. Alternatively, if the data loggers are not able to determine the duration of the utilization, but only the situation of the device being on or off (i.e. used or not used during that day), the share of 50:50 may be used

Data / Parameter:	$B_{y=1,new,i,j,survey}$
Data unit:	Tonnes
Description:	Quantity of woody biomass used by project devices in tonnes per device of type *i*.
Source of data:	Sample survey of end user or direct measurement at each end user locations.
Value(s) applied	To be monitored at CPA level.
Measurement methods and procedures:	Determined in the first year of the introduction of the devices (e.g. during the first year of the crediting period, y=1) through measurement campaigns at representative households and/or sample survey. Sample surveys to estimate this parameter, that are solely based on questionnaires or interviews (i.e. that do not implement measurement campaigns) may only be used if the following conditions are satisfied: • Pre-project devices have been completely decommissioned and only efficient project device(s) are exclusively used in the project households; • If multiple devices are used in the project, it is possible from the results of the survey questions to clearly differentiate the quantity of woody biomass being used by each device. In other words, if more than one device, or another device that consumes woody biomass, are in use in project households, then the sample survey needs to distinguish the quantity of biomass used by the project device and the other devices that use biomass
Monitoring frequency:	Once within first year of project installation
QA/QC procedures:	Survey to be conducted in accordance with "Standard for sampling and surveys for CDM project activities and programme of activities, version 08.
Purpose of data	Calculation of baseline and project emissions
Additional comment:	None

Data / Parameter:	$N_{d,HH}$
Data unit:	Number
Description:	Number of project devices distributed per household
Source of data:	CPA database
Value(s) applied	To be monitored at CPA level
Measurement methods and procedures:	Recorded at the time of stove installation/distribution
Monitoring frequency:	Once at the time of CPA implementation
QA/QC procedures:	The unique reference number of each stove shall be logged in the monitoring database showing the total number of stoves per household. Internal cross-checks by the CME or CPA implementer will be undertaken as QC.
Purpose of data	Calculation of baseline and project emissions
Additional comment:	Results of ex post monitoring/survey not to be used for determining this parameter.

Data / Parameter:	η_{old}
Data unit:	Fraction
Description:	Efficiency of pre-project device
Source of data:	Default
Value(s) applied	0.10/0.20
Measurement methods and procedures:	Recorded at the time of registration of project stove

Monitoring frequency:	Once at the time of CPA implementation
QA/QC procedures:	At the time of project stove distribution/installation, the nature of baseline stove with respect to it being a i. three-stone fire using firewood (not charcoal), ii. conventional device with no improved combustion air supply or flue gas ventilation, that is without a grate or a chimney iii. other types of devices, not included in categories above shall be recorded. For categories (i) & (ii) default value of 0.10 shall be used, & for baseline stoves belonging to category (iii) default value of 0.20 shall be used.
Purpose of data	Calculation of baseline and project emissions
Additional comment:	Fixed for each individual household included in the CPA

Data / Parameter:	Q_{CC}
Data unit:	tons
Description:	Quantity of charcoal used in project device in year y
Source of data:	Sample survey of end user or direct measurement at each end user locations.
Value(s) applied	To be monitored at CPA level.
Measurement methods and procedures:	Direct measurement at representative households identified through sampling.
Monitoring frequency:	Annual/biennial
QA/QC procedures:	Survey to be conducted in accordance with "Standard for sampling and surveys for CDM project activities and programme of activities, version 08.
Purpose of data	Calculation of leakage emission on account of replacement of firewood baseline stove with efficient charcoal stove
Additional comment:	Applicable only to CPAs where firewood consuming baseline stoves are replaced with improved charcoal stoves.

Data / Parameter:	**Life Span**
Data unit:	Years
Description:	The operating life- time of the project device.
Source of data:	Manufacturer (certified by a national/international standards body or an appropriate certifying agent)
Value(s) applied	To be declared in individual SSC CPA DD
Measurement methods and procedures:	None
Monitoring frequency:	Recorded once at the time of CPA implementation
QA/QC procedures:	none
Purpose of data	Methodology requirement
Additional comment:	None

Data / Parameter:	**Date of commissioning of batch j**
Data unit:	Date
Description:	Stoves can be grouped in batches and latest date of commissioning of a device within the batch shall be used as the date of commissioning for the entire batch.

Source of data:	CPA database
Value(s) applied	To be reported for each batch in monitoring report
Measurement methods and procedures:	None
Monitoring frequency:	Recorded at the time of commissioning of last stove in a batch
QA/QC procedures:	None
Purpose of data	Methodology requirement
Additional comment:	None

Data / Parameter:	**Date of commissioning of project device i**
Data unit:	Date
Description:	Date of commissioning of individual stove
Source of data:	CPA database
Value(s) applied	Reported in emission reduction calculation sheet for a monitoring period
Measurement methods and procedures:	None
Monitoring frequency:	Recorded at the time of installation or distribution or completion of registration process of an individual stove.
QA/QC procedures:	None
Purpose of data	Methodology requirement
Additional comment:	None

I.7.2. Sampling plan

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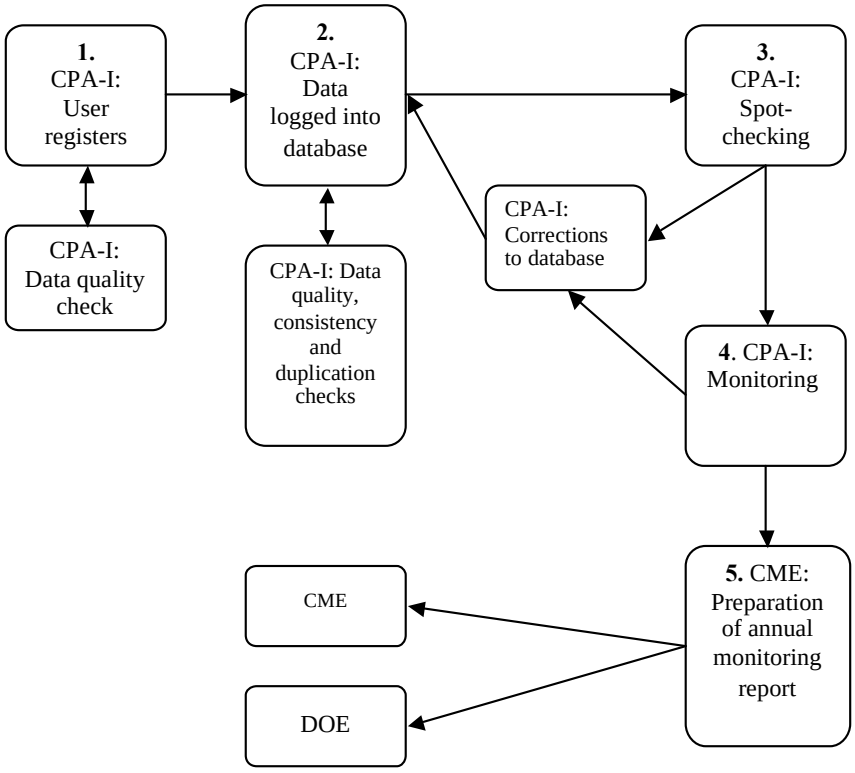
The Monitoring Plan applied in this SSC-PoA involves a number of key elements that ensure that the CME and CPA-Implementer have high-quality, unbiased and reliable information regarding the performance of the project in terms of implementation and outcomes, and for the purposes of calculating Certified Emission Reductions (CERs) following AMS II.G version 11 on the basis of the amount of non-renewable biomass saved by the ICS in the project activity. The key elements are the following:

- Data collection procedures
- Distribution and Monitoring Database
- Spot Checking of ICS (ongoing)
- Sample Plan for the Monitoring Survey
- Data Quality, Consistency and Duplication Checks
- Monitoring Reporting

The below flow-chart illustrates the roles and responsibilities of the parties during the implementation of the monitoring plan for the SSC-CPA. In the below flowchart, the CPA implementer is abbreviated to “CPA-I”, and can be CQC or another party authorized by the CME. CQC is the CME.



Below is the description of the above steps on the flow-chart.

1. **CPA-I: User registers stove:** CPA implementer will collect/receive the necessary information requested on the Registration Card from the user. Means of collecting this information may be through a physical Registration Card filled by CPA-Imp staff, retailers, end-users or partner organization's staff, or through the use of ICTs or SMS. CPA Implementers' staff shall double check the accuracy of information provided, and request for field staff additional clarifications if needed;
2. **CPA-I: Data logged into database:** CPA implementer trained staff will input the data in the database either manually (if data collected from physical Registration Card) or this will be automatically input if data was collected using ICTs or SMS. CPA implementer staff shall double check the information included on the database and check for duplications. Any duplicate information shall be investigated and errors corrected or excluded from the database if it is a true duplicate entry.
3. **CPA-I: Spot- checking (ongoing):** CPA implementer field staff will randomly select units included in the database and visit or contact the stove users to cross-check the information on the database with the factual evidence in the field. Any inconsistencies found (eg. change in the address of a user) will be updated on the database, and in the case ICS are found to be no longer in use, they will be clearly marked as such and excluded from emission reductions calculations.
4. **CPA-I: Monitoring:** CPA implementer will follow the requirements as per POA-DD to collect the necessary information for a monitoring report.
5. **CME: Preparation of monitoring report:** the CPA implementers or the CME will prepare the final monitoring report to be provided to the verifier DOE for verification of emission reductions. A copy of the monitoring report will remain with the CME.

The CME will coordinate and manage each CPA Implementer and assist them in implementing each element of the monitoring plan. Monitoring plan shall be elaborated in accordance with the Sampling Plan below.

Sampling plan:
As per the *Standard for Sampling and Surveys for CDM Project Activities and Programme of Activities, version 08.0,* the sampling plan is the following:

(a) Sampling design

Due to the large number of ICS envisioned to be distributed as part of the CPAs to be included in the PoA, it is not economically feasible to monitor each individual ICS unit distributed. Therefore, representative sampling will be undertaken at CPA level and if possible as part of a PoA-wide Sampling Plan (by grouping and sampling across CPAs) only if the criteria defined under point (iii) – 'Sampling Frame', below is fulfilled and is in line with the requirements of the "Standard for sampling and surveys for CDM project activities and programme of activities", version 08.0.

(i) Objectives and Reliability Requirements:

The objective is to obtain an unbiased and reliable estimate of the proportion or mean value of the following key variables over the course of the crediting period, and with 95/10 confidence/precision (as per paragraph 23 of Standard for sampling and surveys for CDM project activities and programme of activities", version 08.0) since each CPA implemented under the PoA shall consist of microscale CDM units. For CPAs not qualifying the conditions under paragraph 12 of Tool 19, the requirements under paragraph 46 of the applied methodology AMS II.G, version 11.0 shall apply that is 90 % confidence interval and 10% margin of error for annual sampling and 95% confidence interval and 10% margin of error for biennial sampling.

Monitored Parameters:

Sr. no	Parameter	Description of Parameter	Frequency
1	$N_{y,i,j}$	Number of ICS still in operation	Annual/biennial
2	μ_y	Adjustment to account for any continued use of pre-project devices. (in case equation 7 of methodology is used)	Annual/biennial
3	$\eta_{new,i,j}$	Efficiency of device type 'i'; batch 'j'	Annual
4	$B_{y=1,new,i,survey}$	Quantity of woody biomass used by project devices in tonnes per device. (in case equation 8 of applied methodology is used)	Once, within 1st year of project start date

(ii) Target Population:

- The target population for parameters 1,2 and 4 are all households in the PoA database which are using fuel wood in ICS distributed under the PoA for cooking. The target population for parameter 3 is the set of stoves that are operational and belong to same vintage and model.

(iii) Sampling Frame

The PoA is to be implemented in Senegal, Ghana, Nigeria , Malawi, Zambia and Zimbabwe. The

sampling will take into account the country in which the CPA is implemented, and separate sampling will be made for each country. To ensure the homogeneity of the CPAs included in a single sampling plan, two sampling frames shall be defined. In overall, all CPAs will have the same group of end users which is household. Thus, it is expected that the geographical locations do not have influence on the parameter of interest. Therefore, all these 4 parameters can be assumed to be highly homogeneous for each ICS model regardless of how the end user group and distribution/installation location is defined.

The sample frame refers to all the information sources on the Database. There are two primary mechanisms for data collection: the Registration database for newly distributed/installed ICS and the Monitoring Survey (which includes a household questionnaire and visual inspection of ICSs) that will be used throughout the lifetime of the PoA. The Monitoring Survey follows "Standard for Sampling and Surveys for CDM Project Activities and Programme of Activities; version 08.0

The POA is open to different CPA Implementers and different models of ICS in different countries and regions (clusters). As per "Standard for Sampling and Surveys for CDM Project Activities and Programme of Activities", version 08.0, for the use of a single sampling plan covering a group of CPAs, provided the homogeneity of population can be demonstrated, or differences are taken into account in the sample size calculation, a 95/10 confidence/precision is applied. Paragraph 23 of the same standard also requires a 95/10 confidence/precision for sampling surveys in all cases, whether the CPAs are grouped together or when sampling is conducted at the CPA level for CPAs that are solely composed of "microscale CDM units[49]"

The first step is to identify the Primary Sampling Units. Primary sampling unit is the sampling frame for CPAs which have:

1. The same ICS model
2. Same country and fuel-consumption cluster (if applicable[50]) within that country
3. Same Vintage

While point number 2 is applicable for parameters $N_{y,i}$ and μ_y , for parameter- $B_{y=1,new,i,\ survey}$ same ICS model and same fuel consumption cluster shall be applicable that is points 1 and 2 and all the three points that is 1,2 & 3 are applicable for defining Primary Sampling units for parameter $\eta_{new,i}$.

Criteria for grouping & sampling across CPAs
All the four parameters namely - $N_{y,i}$, μ_y, $B_{y=1,new,i,\ survey}$ and $\eta_{new,y,i}$ will be monitored at the CPA level. Grouping and sampling across CPAs may be undertaken only under circumstances when CPAs belong to same country and same fuel using cluster for parameters $N_{y,i}$, μ_y and same country, same fuel use cluster, same model and same vintage for parameter $\eta_{new,y,i}$.. For $B_{y=1,new,i,\ survey}$, grouping and sampling across CPAs may be undertaken if CPAs belong to same country and have distributed same model of ICS.

1) Sampling frame for proportion of ICS still in operation $N_{y,i}$, and Adjustment to account for any continued use of pre-project devices (μ_y)

While factors such as, country in which the CPA is implemented and different fuel using clusters (charcoal/wood) within the same country, evidently influence parameters $N_{y,i}$ and μ_y, other factors namely vintage and stove model do not make a difference. Hence for a CPA or group of CPAs

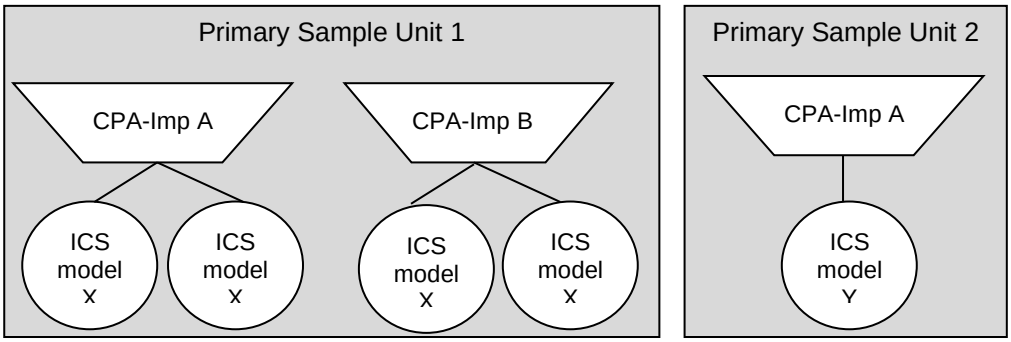
[49] For CPAs not qualifying under paragraph 12 of Tool 19, the requirements of the applied methodology shall apply- 90 % confidence interval and 10% margin of error for annual sampling and 95% confidence interval and 10% margin of error for biennial sampling.

[50] Only applicable for Ghana Charcoal and Nigeria Charcoal, where 3 and 4 clusters have been defined respectively.

implemented within the same country, there will be a single sampling unit, if the beneficiaries belong to same fuel using cluster even if the model of project stove is different or the stoves belong to different vintages.

2) Sampling Frame for Thermal Efficiency of operational ICS ($\eta_{new,i}$)

The thermal efficiency of operational ICSs shall vary in accordance with its model, but not within different CPA Implementers. The thermal efficiency of the ICS is expected to change over the time. Hence for parameter $\eta_{new,i}$ the Primary Sampling Unit shall be defined as the group of ICSs of the same model and same vintage, and located within the same country and within the same fuel-consumption cluster in that country. If the same CPA Implementer has two different ICS models being implemented in the same vintage within a country – this will form two Primary Sampling Units. Two primary sampling units will also be defined if the stove population has two vintages and all other factors (Stove model and CPA Implementer) remain same. The below schematics illustrate one of the examples used above assuming two ICS models in one vintage and implemented by two CPA implementers within the same country.



3) Quantity of woody biomass used by project devices in tonnes per device ($B_{y=1,new,i,\ survey}$)[51]

Similar to thermal efficiency $B_{y=1,new,i,\ survey}$ shall vary in accordance with its model, but not within different CPA Implementers. For this parameter, CPAs with the same ICS model can be grouped together and form a Primary Sampling Unit. In the event the SSC-CPA has two different CPA Implementers using the same ICS model, these will form a single Primary Sampling Unit. However, if the same CPA Implementer has two different ICS models being implemented – this will form two Primary Sampling Units.

(iv) Sampling Method:

Simple Random Sampling will be used and samples will be randomly selected from the primary sampling units as illustrated above. To ensure a random selection of ICS, random number generators shall be applied. Each ICS in the target population is uniquely identifiable by its unique ID number. Each ICS can thus be allocated a Sample Selection Number in each monitoring period, starting at 1 and increasing up to the total number of ICS in the Database for that pre-defined sampling frame. Applying the random number generators, the ICS can then be randomly chosen from the defined population up to the required sample size calculated by the CME.

[51] For CPAs requiring the measurement of charcoal consumption in project devices, the same sampling approach as $B_{y=1,new,i,\ survey}$ shall be applicable.

To determine the parameters, sampling will involve the following approaches (outcome in brackets):

$Ny_{,i,j,}$	Visual inspection of the premises to see if ICS is operational and in use. Interview with end user if required to verify that ICS is still in use (Yes/No)
$\mu_{y,}$:	Interview with end user and visual inspection to determine if a baseline (replaced) stove is still being used in addition to ICS (Yes/No)
$\mathbf{B_{y=1,new,i,\ survey}}$	Interview with end user for determining/measuring average quantity of fire wood used in the project stove per day.
$\boldsymbol{\eta_{new,i}}$:	ICS will be tested using WBTs (ICS thermal efficiency)

The efficiency of ICS ($\eta_{new,i}$) as determined by the water boiling test evaluated during the monitoring period. The efficiency of ICS will be determined across CPAs using the same stove model, same vintage and same country & cluster within country (Primary Sample Unit). Using the formulas in the section "Sample Size" below, the CME will randomly sample the required number of ICS from the primary sampling units. . As an illustrative example, consider a PoA that distributed a single ICS manufacturer/model in the same country and cluster within that country, but had two vintages: 75% of the total ICS distributed have been in use for less than 365 days (i.e. vintage 1) and 25% have been in operation for over 365 days but less than 730 days (i.e. vintage 2). In this case, 2 Primary Sampling Units shall be formed with each sampling unit representing one vintage. For each vintage, the number of ICSs are to be randomly selected and sampled and the sample sizes are to be determined using the below equations. The mean value of the monitoring parameter of each vintage shall be used for calculating emission reductions for all stoves of vintage *i*. For example, if $\eta_{new,i}$: for stoves of vintage 1 is 26% and for vintage 2 is 24%, then all ICS which have been in use for less than a year (vintage 1) will use a thermal efficiency of 26% in its calculations, while stoves vintage 2 will use 24%.

(v) Sample Size:

For the estimation of the proportion or mean value of the parameters investigated, the minimum sample size for each sample frame has to achieve the 95/10[52] confidence/precision.

The procedure to determine the sample of households will ensure that they adequately represent the broader project population, minimizing sampling error. Using the required reliability (confidence/precision) levels, the samples will be randomly selected from each Primary Sampling Unit. There are three parameters that will be estimated through sampling: the number of stoves still in operation during the monitoring period as determined by the monitoring survey ($Ny_{,j}$), the adjustment to account for continued use of pre-project devices (μ_y), and the average ICS efficiency, ($\eta_{new,i}$). Quantity of woody biomass used by project devices in tonnes per device $B_{y=1,new,i,\ survey}$ shall also be estimated through sampling within the first year of project installation. It can be coupled with $Ny_{,j\ j}$ and μ_y for the first year. Of the three parameters to be monitored, two are proportions/percentages ($Ny_{,j\ j}$ and μ_y) and one is a mean value $\eta_{new,i}$.

In order to calculate the required sample size estimates, values for the proportions, mean values, and standard deviations are required. As per Guideline for Sampling and surveys for CDM project activities and programmes of activities, version 04.0, there are different ways available to obtain the estimates of the parameter of interest:

(a) Refer to the result of previous studies and use these results;

[52] For CPAs not qualifying under paragraph 12 of Tool 19, the requirements of the applied methodology shall apply- 90 % confidence interval and 10% margin of error for annual sampling and 95% confidence interval and 10% margin of error for biennial sampling.

(b) In a situation where information from previous studies is not available, a preliminary sample as a pilot could be conducted and use that sample is used to provide the estimates;
(c) Use best guesses based on the researcher's own experiences.

For the registration/inclusion purpose of CPA-DD, option (c) as stated above shall be applied. For the first monitoring period, values from a pilot study shall be applied. For the following monitoring periods, the estimates shall be adjusted taken into account the results of the previous monitoring period(s) or the result from recent pilot study which is conducted after the previous monitoring periods.

As the PoA is implemented in more than one country, for illustration purpose of sample size calculation in PoA-DD, the sample size calculation given below is based on the scenario in Senegal as this is the host country of the first CPA-DD. The CPA which is included after the PoA registration shall have a unique set of sample size of calculation depends on the project scenario and the country in which the CPA to be implemented.

To estimate the number of sample sizes for parameters $N_{y,j}$ and μ_y the following equation[53] is used.

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

Where:

n	= Sample size
N	= Population size (Total number of households/ICS)
p	= Expected proportion
1.96	= Represents the 95% confidence required (In the case of 90% confidence, 1.645 shall be used)
0.1	= Represents the 10% relative precision

The following assumptions are made to exemplify the sample size calculation for parameters: $N_{y,j}$, μ_y and $\eta_{newy,,i}$.

1. The population size, N, is taken as 100,000 households. (Assuming one ICS for one household).
2. It is expected at least 80% of ICS still in operation, hence the expected proportion *p* for $N_{y,j}$ is taken as 0.8.
3. According to Baseline study, it is expected that 54.9% of baseline stove still in use. As per Standard for sampling and surveys for CDM project activities and programme of activities, a proportion can describe either of the two possible scenarios of the success rate or the failure rate and project proponents may use the larger of the two proportions in the sample size calculation, which is *p* or (1−*p*). The sample size calculation is therefore based on anticipating a continued use of 54.9%. Thus the expected proportion *p* for μ_y is taken as 0.549 which is the value of the larger proportion.
4. The expected mean of ICS thermal efficiency is 0.38 and its standard deviation is 0.076.

Sample size calculation:

[53] Equation 1 of Appendix 2, *Guidelines for Sampling and Surveys for CDM Project Activities and Programme of Activities (Version 04.0)*

The calculation of the required sample size for each parameter in the first monitoring period is illustrated below for a 95/10[54] level of confidence and precision In all cases a conservative approach is taken, however if for any parameter the required confidence/precision levels are not met then the CME will randomly select an additional sample and collect further data from this sample to ensure the pooled data meet or exceed the required thresholds.

Parameter $N_{y,j}$:

Based on the assumptions outlined above, the resulting sampling size for a 95/10 confidence/precision is calculated as:

$$n \geq \frac{1.96^2 \times 100{,}000 \times 0.8(1-0.8)}{(100{,}000-1) \times 0.1^2 \times 0.8^2 + 1.96^2 \times 0.8(1-0.8)} = 96$$

Therefore, in this case a sample size of 96 to be sampled from the primary sampling unit.

In case the resulting sample size to achieve the desired confidence/precision levels is smaller than 30 ICS, a minimum sample size of 30 shall be chosen when the parameter of interest is a proportion.

Parameter μ_y

The example below uses the value of μ_y found in the Senegal Wood baseline which is 0.549[55,56].

Based on the above assumptions, the sample size calculation for a 95/10 confidence/precision would be:

$$n \geq \frac{1.96^2 \times 100{,}000 \times 0.549(1-0.549)}{(100{,}000-1) \times 0.1^2 \times 0.549^2 + 1.96^2 \times 0.549(1-0.549)} = 315$$

The required sample size to be sampled from the primary sampling unit is at least 315.

As in the case of parameter $Ny_{,j}$, if the resulting sample size based on the above equation is smaller than 30 ICS, a minimum sample size of 30 shall be chosen when the parameter of interest is a proportion.

[54] For CPAs not qualifying under paragraph 12 of Tool 19, the requirements of the applied methodology shall apply- 90 % confidence interval and 10% margin of error for annual sampling and 95% confidence interval and 10% margin of error for biennial sampling.

[55] It is expected that the majority of end users will not use the baseline stoves after they have received the new and more efficient stoves (in order to make the decision to purchase the new stove, the end user has perceived an opportunity to reduce fuel costs/labour by making an investment that will only pay off if they stop cooking with their inefficient stove). Therefore, the value is thought to be conservative.

[56] The value corresponds to the μ_y value found in the Senegal Wood baseline study conducted during first PoA period. In cases where the percentage of second stove use is less than 0.50, it will be appropriate to use the larger proportion (1- μ_y) to determine the sample size, in accordance to EB 69 Annex 4 paragraph 11(a).

Parameter $\eta_{new,i}$ **:**

For the purposes of determining sample size in the first monitoring period, the performance of ICS can be categorized into two groups, which are characterized by the range of likely mean efficiency and the likely values of SD relative to the mean, according to the type of ICS. The ICS models that are manufactured in modern factories tend to be very highly efficient (30-50% thermal efficiency) and have been designed to meet stringent efficiency specifications so the standard deviation is expected to be relatively low.

Where key components of ICS (e.g. the combustion chamber and flue) are not manufactured but instead are installed on-site or handmade, then the mean efficiency is expected to be in the range of 20-30% with relatively higher variability.

To estimate the sample size for parameter $\eta_{new,i}$ the following equation[57] is used:

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

Where:

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

n	= Sample size
N	= Population size (Total number of households/ICS)
mean	= Expected mean of ICS thermal efficiency
SD	= Expected standard deviation
1.96	= Represents the 95% confidence required (In the case of 90% confidence, 1.645 shall be used)
0.1	= Represents the 10% relative precision

Based on the above assumptions, the sample size calculation for a 95/10 confidence/precision would be

$$n \geq \frac{1.96^2 \times 100{,}000 \times \left(\frac{0.076}{0.38}\right)^2}{(100{,}000-1)\times 0.1^2 + 1.96^2 \times \left(\frac{0.076}{0.38}\right)^2} = 15.36$$

If the resulting sample size based on the above equation is smaller than 30 ICS, then as the parameter of interest is a numeric mean value (i.e. not a proportion or percentage) the Student's t-distribution shall be used.

The sample size for parameter $\eta_{new,y,i}$ is referred to the equation below[58]:

$$n = \left(\frac{t_{n-1} \times SD}{0.1 \times mean}\right)^2$$

[57] Equation 4 of Appendix 2, *Guidelines for Sampling and Surveys in CDM Project Activities and Programme of Activities* (version 04.0).

[58] Equation 38, page 46, *Guidelines for Sampling and Surveys in CDM Project Activities and Programme of Activities* (version 04.0)

Where t_{n-1} is the value of the t-distribution for 95% confidence when the sample size is n. Since the sample size is not known yet, the first step is to use the value for 95% confidence when the sample is large, i.e. 1.96 and then redefine the calculation.

$$n = \left(\frac{1.96 \times 0.076}{0.1 \times 0.38}\right)^2 = 15.37$$

Thus n is rounded up to 16.
The calculation now need to repeat using t-value for 95% confidence and n = 16

$$n = \left(\frac{2.131 \times 0.076}{0.1 \times 0.38}\right)^2 = 18.17$$

And n is rounded to 19.

The calculation now need to repeat using t_{n-1} value for n = 19. The process should be iterated until there is no change to the value of n.

t_{19-1}	2.101
n=	17.66
Round up	18

t_{18-1}	2.110
n=	17.81
Round up	18

The repeated calculation shows that n = 18. Thus the sample size to be sampled from the sampling unit is 18.

The sampling for parameter $\eta_{newy,I}$ shall comprise of ICS installed/distributed during the current vintage and oldest vintage. The annual efficiency loss of ICS established from these two vintages may be used to correct the initial efficiency of the ICS installed/distributed later on.

Sample size estimation of 'Quantity of woody biomass used by project devices in tonnes per device' ($B_{y=1,new,i,\ survey}$) shall be included in the CPA DD depending on choice of option for estimation of $B_{y,\ savings}$.

The CME may choose to use the same sample to monitor more than one parameter. According to the Standard for sampling and surveys for CDM project activities and programme of activities, if there is more than one parameter to be estimated, then a sample size calculation should be done for each of them. Then either the largest number for the sample size is chosen as sampling effort with one common survey, or separate sampling efforts and surveys are undertaken for each parameter. For instance, the CME can sample separately $Ny_{,j}$ and μ_y, $B_{y=1,new,i,\ survey}$ and $\eta_{new,i}$ –or a combination of these parameters- in the same sample. Since parameters $Ny_{,j}$ and μ_y, $B_{y=1,new,i,\ survey}$ share the same sampling units, CME may choose to have one common survey for these three parameters with largest number of sample size between these two parameters is chosen, then a separate sampling effort may be arranged for parameter $\eta_{newy,,i}$. Sampling more than one parameter in the same sample helps reduce travel needs for monitoring and the associated costs. At the same time this approach ensures the random selection of samples for every parameter.

Oversampling is strongly encouraged, not only to compensate for any attrition, outliers or non-response associated with the sample, but also to prevent a situation at the analysis stage where the required reliability is not achieved and additional sampling efforts would be required. The sample size shown above will be adjusted upwards to account for non-responses, CME shall determine the appropriate non-responses rate based on previous experience.

(b) Data

(i) Field Measurements:

To monitor the number of stoves that continue to be in use ($N_{y,j}$) and the percentage of continued baseline stove use among ICS households in the database (μ_y), the data collected will be a representative number of stoves in the database for the monitoring period. The scope is a representative sample of stoves across all CPAs with the same CPA Implementer, same ICS model, same country and cluster within a specific country in this PoA, and same vintage. The method of collecting data will be field surveys of required sample size of ICS users in the database. Frequency of data collection is Annual/biennial. Data will be collected from the field surveys, entered in the database and included in the monitoring report.

For monitoring $B_{y=1,new,i,\ survey}$, the data collected will be representative number of stoves in the database that were distributed within one year of start date of CPA implementation. The method of collecting data will be field survey and frequency will be once during the entire crediting period.

To monitor the efficiency of the stove at least every two years (as required by the AMS II.G version 11 methodology) a new test will be conducted to determine the rate at which a sample of stoves from a given vintage year deteriorate in efficiency. The method to collect the efficiency data will be the Water Boiling Test.

The table below summarizes field measurement data requirements

Parameter	**Timing (indicative)**	**Frequency (required by AMS II.G –Version 11)**	**Methods to be applied**	**Comments on seasonal fluctuation**
$N_{y,j}$	Monitoring will likely occur every 12 months	annually/biennially	Visits to the premises, visual inspection and interview with ICS end-user.	Unlikely to be due to any seasonal fluctuation.
μ_y	Monitoring will likely occur every 12 months	annually/biennially	Visits to the premises, visual inspection, and interview with ICS end-user.	Unlikely to be due to any seasonal fluctuation.
$\eta_{new,i}$	Monitoring will likely occur every 12 months, and will include ICS from all vintages for which emissions reductions are to be claimed in that monitoring period.	annually	Water Boiling Test (WBT) Protocol Version 4.2.3 (or more recent at the discretion of the CME).	Not due to any seasonal fluctuation.

$B_{y=1,new,i,\ survey}$	Within 1st year from the starting date of CPA implementation for CPAs applying equation 8 of applied methodology.	Once. The value will be fixed for entire crediting period	Visits to the premises, visual inspection, measurement and interview with ICS end-user.	unlikely

(ii) Quality Assurance/Quality Control:

The CME will apply measures to ensure the required confidence/precision for each sampled parameter is met, allowing for non-response and the possible removal of outliers from the sample, as part of a Quality Control/Quality Assurance system. The choice of measure applied to each parameter will depend on the cost of each data collection approach and logistics required. The CME will determine the most effective measure for each parameter from the following list (illustrated using a required sample size of 20 and an effect of non-response of 2 to 4 ICS[59]):

- Oversampling: Randomly draw a sample of at minimum 24 ICS and collect data from each
- Buffer Group: Randomly draw a sample of at minimum 24 ICS and collect data from only 22 ICS. If this would not result in the required sample size data would be collected from the additional 2 ICS that were selected in the sample.

- Draw an additional sample: Randomly draw a sample of 22 ICS and collect data from these. If the required sample size is not achieved, an additional sample of 2 elements will be drawn and included in the sample.

- Use lower confidence bound (of $Ny_{,j}$, $B_{y=1,new,i,\ survey}$ or $\eta_{new,i}$) or, with a conservative approach according to the parameter definitions, the upper confidence bound of μ_y.

The CME may choose to stop monitoring a particular parameter once the required level of confidence/precision has been reached, as long as the calculated minimum number of samples has been achieved. As an example, the following steps could logically be followed for the case of applying a 30% buffer:
1. Visit first 10% of premises required for the 30% buffer. If the number of responses is sufficient to achieve the required reliability level, then stop sampling.
2. If step 1 is not sufficient to achieve the required reliability level, then visit the next 10% of premises (increases the additional sampling to 20% of the 30% buffer). If this additional sampling is sufficient, then stop sampling.
3. If step 2 is not sufficient to achieve the required reliability level, then complete the final 10% of the additional sampling buffer (bringing the total to 30%).

The sampling plan has the following procedures in place to ensure good quality data. The CME will ensure that field personnel have reviewed, understand and have agreed to follow the monitoring plan procedures, including provisions for maximizing response rates, documenting out-of-population cases, refusals and other sources of non-response. A quality control and assurance strategy will be documented. Quality control and assurance strategies include addressing non-sampling errors, such as non-response or bias from interviewer. The CME or a competent third party designated by the CME with the proper skills will train the monitoring personnel on how to properly survey households to prevent bias from interviewer. In the case a household refuses to

[59] The 2 to 4 values help exemplify variations in response rates. The value of 2 corresponds to higher response rates; the value of 4 is for lower response rates. The actual non-response rates applied to the final sample size shall be determined by CME.

participate, another household will be chosen at random. To reduce interviewer bias, good questionnaire design and well-tested questionnaires will be used.

The calculation of the sample size will be carried out using estimates for parameter proportions, mean values, variances, and standard deviations, as the actual characteristics of the population/sampling frame are unknown. In order to ensure the quality of the sampling results, the CME can draw on the provisions for reliability calculations including estimating the bounds of the confidence interval, the standard error of the mean value or proportion, and the t-value as derived from the t-distribution[60]. In the event that the sampling results do not fulfil the required level of confidence and precision, the CME can undertake additional samples. If the reliability is still not sufficient after raw data and summary statistics are scrutinized and after additional samples have been collected[61], the sampling may be repeated with an increased sample size. Alternatively, the CME may choose to apply the lower bound (or higher bound according to the more conservative approach,

As the continued use of ICS and the incidence of baseline stove usage among ICS users are binary parameters, there can be no outliers in the sampled data and no treatment for outliers is required. The sample data for $\eta_{new,i}$ is continuous and therefore the presence of outliers is possible. To identify and address outliers for the parameter $\eta_{new,i}$., outliers will be defined as those data points with values greater than three standard deviations from the mean of the sample for each vintage.

Data points identified as outliers according to the above analysis will be examined further to correct for possible transcription and data entry errors, but will be omitted from the analysis if no such administrative errors exist.

(i) Data archiving

Hard copies of the surveys will be kept and the database will have back up. Original stove purchase contracts, information collected from the Registration Card) or other means of acceptance by the users will be stored in the main office for the coordinating entity. 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 two years after the end of the crediting period or the last issuance of CERs for the project activity, whichever is later.

(ii) Analysis:

The CME will manage a project database that includes the following data that can be directly attributable to each CPA within the PoA, thereby allowing unambiguous determination of the emission reductions attributable to each CPA:

- A list of households participating in each CPA, including name, community/location, distribution/installation date and unique serial number;
- Testing to ensure that the stoves are still operating above the minimum 20% efficiency required by the AMS II.G (version 11) methodology, by the CPA Implementer, CME or a third party certified by a national standards body or an appropriate certifying agency recognized by it.
- Where replacements are made, assurance that the efficiency of the new ICS is similar to the specified.

Data obtained from the samples will be used to estimate proportions and mean values for the parameters described above. The values will then be factored into the emissions reduction calculations and result in the request for issuance of CERs for that group of CPAs – the primary

[60] As provided by the *Guidelines for Sampling and Surveys in CDM Project Activities and Programme of Activities* (EB 69, Annex 5 paragraphs 220 to 290)

[61] As per EB 69 Annex 5 paragraphs 258 to 314.

sampling Units. The parameters are applied for emission reduction calculations as outlined in Part II Section I.6.3 of the PoA-DD. The stoves that are not in use will be excluded from emissions reductions calculations and will not be counted towards the total number of ICS in operation during the monitoring period. The thermal efficiency of new stoves ($\eta_{new,i}$) will be used in the calculation of the per stove emission reduction, which will be multiplied by the number of stoves in operation in the CPA to obtain the emission reductions per CPA.

(c) Implementation:

Sampling for the purpose of emission reduction calculation and elaboration of the monitoring report will occur at the end of each monitoring period. This sampling will be conducted by trained personal either part of the CPA Implementer or CME team, or an experienced third party entity. The credentials and/or training materials for the sampling personal will be provided to the DOE at verification. The maximum length of one monitoring period will be two years (duration, not calendar years), as AMS II.G., version 11, provides the option for annual or biennial monitoring. The CPA Implementer will be responsible for managing household data collection and entry into the project database. Field personnel will receive training on how to properly deal with surveying techniques and reduce errors and sign a document certifying that there is no conflict of interest of those involved in data collection and analysis. If there is conflict of interest, the personnel will not be allowed to participate in data collection and analysis. The project database will record the start and end dates of each monitoring period, and record the emission reductions attributable to each monitoring period. Appropriate record keeping procedures will be implemented to ensure that each monitoring period data set can be transparently attributed to its corresponding CPA, preventing any occurrences of double counting. An internal review of the project database will be able to determine the current status of each SSC-CPA—the duration of previous monitoring periods, the households delivering monitoring data, and current verification activities.

Assessment for Leakage
See Part II Section I.2. According to methodology II.G, version 11, paragraph 39, leakage related to the non-renewable woody biomass saved by the project activity shall be assessed on *ex-post* surveys of users and the areas from which the woody biomass is sourced. The methodology offers the alternative that if B_{old} is multiplied a net to gross adjustment factor of 0.95 to account for leakages, surveys are not required. This PoA will use the 0.95 leakage adjustment factor instead of *ex-post* surveys.

.Disposal of Low Efficiency Appliances and Use of Baseline Stoves

. In line with equation 2 of the applied methodology, CPAs using equation 7 are required to determine whether pre-project devices are still in use along with project ICS and if found so, an adjustment factor 'μ_y' to account for use of wood in pre-project devices needs to be applied to emission reduction- $ER_{y,i,j}$ The number of households continuing to use a baseline stove in addition to their ICS, will be monitored throughout the project lifetime using sampling approach described above.

Monitoring Reporting

The CME will assess all monitoring data and produce a monitoring report for each CPA for the DOE to verify corresponding to the preceding monitoring period of all CPAs. This report will present the data relating to the emission reductions generated by those CPAs during the monitoring period.

I.7.3. Other elements of monitoring plan

>>
Please refer to Section I.7.2.

SECTION J. Crediting period type and duration

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The type of crediting period for the generic CPA is renewable. The length of each crediting period is 7 years and 00 months.

The CPA is expected to have an operational lifetime of 21 years and 00 months (total of 252 months).

SECTION K. Eligibility criteria for inclusion of CPAs

>>

No.	Eligibility criterion - Category	Eligibility criterion - Required condition	Supporting evidence for inclusion
1	Conditions to check the target group of ICS.	Promote and install / distribute ICS in/to residential households in rural, urban, and peri- urban areas[62] that use wood or charcoal fuel following the SSC-PoA specifications[63].	Indication of ICS model to be distributed/installed, geographic scope of distribution/installation, and thermal efficiency tests to confirm model is a high biomass fired cook stove.
2	Geographical boundaries of CPAs consistent with the geographical boundary of the PoA.	Be implemented entirely within a single fuel- specific geographical boundary (as specified in Part I Section A.2 of the PoA-DD) according to the targeted fuel type, fuel-consumption cluster [64] (if applicable), and host country region[65] of the CPA[66];	Self declaration by CPA Implementer indicating single fuel-specific geographical boundary of the CPA. The possible geographic boundaries should be within the limits outlined in Part I Section A.2 of this document.

[62] For the purposes of this PoA, peri-urban areas fall within the definitions of urban areas in each of the countries and are therefore considered like urban areas.

[63] The CME will not certify or test any specific organization (CPA implementer), but it reserves the right, at its sole discretion, to chose CPA implementers based on its track-record and ability to successfully distribute and monitor ICSs. As per eligibility criterion #11, it will require the stove/s used in a particular CPA meets minimum efficiency criteria. The proof of this can be a Water Boiling Test result for the stove model/s identified in the CPA.

[64] A fuel-consumption cluster is a population that has different fuel consumption patterns than other populations as defined by the fuel-consumption baseline studies attached to the PoA-DD. Each fuel consumption cluster is considered a homogeneous population.

[65] Country regions are defined in the fuel-consumption baseline studies attached to the PoA-DD and may include an entire country.

[66] For avoidance of doubt, each CPA will be restrained to a specific geographically-defined fuel-consumption cluster. For example, data demonstrated three distinct fuel-consumption clusters in Ghana (Greater Accra Area, Urban Southern and Central Regions and Rural Southern and Central Regions). If stoves are distributed in the three, the Greater Accra Area and in urban and rural Southern and Central Regions, the stoves distributed in the Greater Accra Area will belong to different CPAs than stoves distributed in urban Southern and Central Regions than the stoves distributed in rural Southern and Central Regions, even if the stove model distributed and the CPA Implementer are the same.

3	Additionality check and Conditions to ensure that each ICS under CPAs that will be included meets the criteria of microscale at ~~-~~unit level or the aggregate CPA size conforms to small scale threshold and remains within those thresholds throughout the crediting period of the CPAs in which case conditions for debundling check to be demonstrated.	Each CPA qualifying under paragraph 12 of Tool 19, version 09.0, in addition to being eligible under paragraph 12 (a)- implemented in LDC/SUZ of host country or 12 (b)- penetration of project technology is less than or equal to 5% of technologies in the region, will satisfy the ~~criteria for~~criteria for demonstrating additionality by establishing that it comprises of distributed units with an energy saving limit of ~~<= 1.8~~less than equal to 60 GWhth/yr and end users are households /communities. Each CPA not qualifying under paragraph 12 (a) or (b) of Tool 19; version 09.0, will satisfy the criteria for demonstrating additionality in accordance with figure 2 of Tool 19. Also, debundling check for such CPAs shall be demonstrated in accordance with Paragraph 124 (n) of CDM PoA PS, version 02.	The following need to be submitted by CME/CPA implementer (i) ER spreadsheet demonstrating that a single ICS achieves an energy saving of no more than ~~1.8~~60 GWhth/yr for CPAs comprising of microscale CDM units or aggregate energy saving of CPA within small scale threshold of 180 GWh_{th}/yr with energy saving of individual unit no more than 1.8GWh_{th}/yr[67] for CPAs not comprising of microscale CDM units. (ii) Statement in Specific CPA indicating that Improved cook stoves under the PoA will be distributed for household /community use only. For demonstrating that the CPA is implemented in rural area defined as SUZ in section C above, the CME/CPA implementer shall use publicly available/official data/survey. *(iii)* Self-declaration by CME/CPA implementer for CPAs implemented in LDCs.
4	Conditions related to the database requirements of ICS user.	Have a database that will uniquely identify and define households in which ICS have been installed or distributed [68] . In addition, each stove itself will be uniquely identified with a serial number clearly starting with "CQC-SSA"	Outline of the status of the database, a database (empty of stoves if no stoves have been added to the CPA), and description of CPA database.

[67] 1% of small-scale threshold (0.6 GWh annual energy saving)

[68] Part II Section A.1 of the POA-DD clarifies how the CME collects information and what information it collects from users when ICSs are distributed and how the information is stored in the database. This information and procedures are also described on the CME manual which shall be provided to the DOE at time of inclusion.

5	Conditions to ensure compliance with the applicability of the applied methodologies.	Comply with the applicability conditions set out in the methodology AMS II.G version 11 "Energy efficiency measures in thermal applications of non-renewable biomass" and further described in Part II Section I.2 of the PoA-DD;These include: (1) the project involves the distribution of energy efficient cooking stoves; (2) these new stoves have an efficiency of no less than 20%; (3) non-renewable biomass has been used as a fuel since 1989(4) proposed method of distribution (5) define steps to ensure that double counting does not occur.	- 1&2)Thermal efficiency tests of stove to be installed/distributed; - 3)Statement that documentation has been provided to the DOE demonstrating that non-renewable biomass has been used since 31 December 1989 within the CPA boundaries; - 4)CME/CPA Implementer self- declaration on proposed method of distribution - 5) To be demonstrated in compliance with requirements stated in sections 6 & 7 below.
6	Conditions to avoid double counting of GHG emission reductions or net anthropogenic GHG removals, such as unique identifications of product and end-user locations.	Do not involve households already using an ICS - including households involved in any other CPA or CDM or other voluntary scheme (such as Gold Standard, VCS, VER+[69]) project involving the distribution or installation of ICS, and households which have purchased or received an ICS on a commercial or non- commercial basis (eg. NGO distributed or government distributed stoves)[70];	- Outline of how each ICS will be uniquely identified - Statement of how CPA will be cross-checked to confirm no double counting with other CPAs, PoAs or projects (in the CDM or other carbon credit schemes) - Statement of how households will confirm that they currently do not own an ICS (whether part of a carbon scheme or not).
7	Conditions to confirm that CPAs are neither registered as CDM project activities, included in another registered PoAs, nor the project activities that have been deregistered.	Not be registered as individual CDM project activities nor included in another registered SSC-PoA, as well as in any other voluntary scheme (such as Gold Standard, VCS, VER+);	Statement in Specific CPA indicating that at the time of CPA inclusion, no other CPA using the same name was found in any other PoA or in a CDM project activity operating in the country using the UNFCCC, the Gold Standard, and other relevant voluntary schemes.
8	Conditions to confirm the approval of CPA by the CME for inclusion of CPA into the PoA.	Be approved by the CME prior to its incorporation into the SSC-PoA;	Declaration from CME that CPA received approval for incorporation into PoA.

[69] VCS is the 'Verified Carbon Standard', and VER+ is the voluntary standard developed by TÜV SÜD.

[70] At time of inclusion the DOE shall confirm that the CPA is using the methods of data collection described in Part II Section A.1 of the POA-DD and in the CME manual, to confirm this eligibility criterion.

9	Conditions to check the start dates of CPAs through documentary evidence.	Be able to provide documentary evidence of the start date[71];	Self-declaration from CME or CPA Implementer stating the starting date of the CPA according to the relevant CDM guidance.
10	Conditions to provide an affirmation that funding from Annex I Parties, if any, does not result in a diversion of official development assistance.	Affirm that no funding is coming from Annex I parties or if it does, that this is not a diversion of Official Development Assistance (ODA)[72];	Self-declaration from CME or CPA Implementer
11	Specification of the technology/measure and performance specification based on testing/certification.	Ensure that the ICS installed/distributed under the CPA are single pot or multi pot portable or in-situ cook stoves with specified efficiency of at least 20%. The efficiency of the project systems (ICS) are certified by a national standards body or an appropriate certifying agency recognized by it (using the WBT outlined in AMS IIG, Version 11 approved by the CDM Executive Board). Alternatively manufacturers' specifications may be used;	The model of stove implemented under the CPA shall demonstrate its efficiency according to the Water Boiling Test – as per AMS II.G. v11 or by manufacturer's specification.
12	Conditions to ensure the compliance with B_{old} requirements of the applied methodologies.	Use baseline fuel consumption (B_{old}) data from the household fuel survey for the country region and fuel-type which is specifically eligible under this POA; Alternatively, historical data which is publicly available can be used for determining B_{old} value for CPAs applying Equation 7 for determining $B_{y, savings,i,a}$.	Statement on the option to determine $B_{ysurvey}$ (equation 7 or 8) shall be included in CPA DD. For CPAs applying equation 7, the choice of survey method or historical data for determining B_{old} value, shall be stated clearly in the CPA DD.
13	Conditions to ensure the compliance with f_{NRB} requirements of the applied methodologies.	fNRB values to be determined for individual CPAs in line with paragraph 49 of the methodology.	The fNRB value for specific CPA shall be declared at the time of CPA inclusion in line with requirements of paragraph 49 of applied methodology.

[71] The starting date of a CPA could either be the date of first installation of a stove or the date of distribution/installation of the first ICS in each CPA, as evidenced by the Registration Card, SMS or ICT records.

[72] At time of inclusion, the CME shall provide the DOE a signed self declaration letter confirm the use or not use of public funding and in case of use of public funding, confirmation this is not a diversion of ODA.

14	Conditions to check the mechanism that transfers the ownership rights of CERs from the ICS user to the CME.	Include a mechanism that transfers the ownership rights of CERs from the ICS user to the CME (or any affiliate it so designates), the precise mechanism to be established on a CPA basis. For example, a Registration Card, SMS, ICT or other means, which is signed or received by the end-user upon distribution or installation of the ICS, which shall state that the end-user transfers ownership of the carbon assets to the CME for the life of the stove[73];	Indication of how the mechanism that transfer the ownership rights of CERs will be implemented.
15	If the generic CPA applies sampling for the determination of parameter values for calculating GHG emission reductions or net anthropogenic GHG removals, conditions related to sampling requirements for the PoA in accordance with the "Standard: Sampling and surveys for CDM project activities and programme of activities.	Adhere to all requirements related to sampling for a PoA in accordance with Part II section I.7.2 of the PoA-DD;	Indication that CPA follows the sampling requirements outlined in Part II Section I.7.2 of this document.
16	Conditions to check the distribution mechanisms of the ICS.	Involve the promotion and distribution of ICS through direct distribution/installation, delivery, community distribution events, direct or distribution through commercial/retail outlets;	Description of ICS promotion and distribution methods under the CPA.
17	Conditions related to environmental impact analysis and Local stakeholders' consultation..	CPA shall indicate what type of environmental analysis is undertaken and provide evidence of compliance with national and local (eg. province level) regulations; Local Stakeholder's consultation has been conducted at PoA level.	Environmental assessment or statement of why an environmental assessment is not needed in the context of the CPA. CPAs included in the PoA are not required to conduct LSC.

[73] Part II Section A.1 of the POA-DD and CME manual further describes the methods and mechanisms mentioned in this eligibility criterion.

Appendix 1. Contact information of coordinating/managing entity and project participants

Coordinating/managing entity and/or project participants	☒ Coordinating/managing entity ☒ Project participant
Organization name	C-Quest Capital Malaysia Global Stoves Limited (CQC)
Country	Malaysia
Address	Brumby Centre, Lot 42, Jalan Muhibbah, 87000 Labuan F.T., Malaysia
Telephone	+ 6 087 593828
Fax	+ 6 087 417242
E-mail	cqc-operations@cquestcapital.com
Website	www.cquestcapital.com
Contact person	Mr Ang Kong Nian

Coordinating/managing entity and/or project participants	☐ Coordinating/managing entity ☒ Project participant
Organization name	ECOEYE Co LTD
Country	Republic of Korea
Address	70 Dusan-ro, Geumcheon-gu, Seoul.South Korea #1503, Hyundai Knowledge Industrial Center B Seoul
Telephone	Office: +82- 2-6480-7346
Fax	n/a
E-mail	sangsun_ha@ecoeye.com
Website	www.ecoeye.com
Contact person	Mr. Sangsun HA

Appendix 2. Affirmation regarding public funding

No public funding from Annex I parties to the United Nations Framework Convention on Climate Change (UNFCCC) are envisaged to be made available for the proposed PoA, or any CPA under the proposed PoA. If public funding from Annex I parties to the UNFCCC is provided, the CME shall confirm that the funding is not diversion of Official Development Assistance (ODA).[74]

[74] Official development assistance (ODA) is defined in the *OECD Glossary of Statistical Terms* as follows: Flows of official financing administered with the promotion of the economic development and welfare of developing countries as the main objective, and which are concessional in character with a grant element of at least 25 percent (using a fixed 10 percent rate of discount). By convention, ODA flows comprise contributions of donor government agencies, at all levels, to developing countries ("bilateral ODA") and to multilateral institutions. ODA receipts comprise disbursements by bilateral donors and multilateral institutions (*OECD Glossary of Statistical Terms*).

Appendix 3. Applicability of methodologies and standardized baselines

Below is the documentation used to justify the use of non-renewable biomass since December 31, 1989 in each of the host countries.

<table>
<tr><th>Country</th><th>Evidence that the non-renewable biomass has been in use since 1989</th></tr>
<tr><td>Nigeria</td><td>
Non-renewable biomass has been in use since December 31, 1989 as evidenced by various FAO statistical data summarized below.

FAO 2003[75] presents data on demand and supply of biomass within the Guinea and Sudan Savannah regions of Nigeria, where Kaduna and Kano are located. Its data indicates a combined deficit of 27.5 million m^3 in 1994 and a projected deficit of 38.9 million m^3 firewood in 2010. These data are presented in the following table.

Comparison of production and demand of fuelwood in Nigeria. (‘000m^3) (FAO 2003)

<table>
<tr><td></td><td>Ecological zones</td><td>1994</td><td>1995</td><td>2000</td><td>2005</td><td>2010</td></tr>
<tr><td></td><td>A. Production</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td></td><td>Guinea Savannah</td><td>7,861</td><td>7,635</td><td>6,500</td><td>6,149</td><td>5,797</td></tr>
<tr><td></td><td>Sudan Savannah</td><td>3,163</td><td>3,267</td><td>2,767</td><td>2,748</td><td>2,359</td></tr>
<tr><td></td><td>Total production</td><td>11,024</td><td>10,902</td><td>9,267</td><td>8,897</td><td>8,156</td></tr>
<tr><td></td><td>B. Demand</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td></td><td>Guinea Savannah</td><td>22,464</td><td>22,808</td><td>25,033</td><td>26,271</td><td>26,417</td></tr>
<tr><td></td><td>Sudan Savannah</td><td>16,054</td><td>17,054</td><td>19,577</td><td>20,118</td><td>20,660</td></tr>
<tr><td></td><td>Total demand</td><td>38,518</td><td>39,862</td><td>44,610</td><td>46,389</td><td>47,077</td></tr>
<tr><td>Summary</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td></td><td>Net deficit (B – A)</td><td>-27,494</td><td>-28,960</td><td>-35,343</td><td>-37,492</td><td>-38,921</td></tr>
</table>

Woodfuel collection in the savanna regions has been described scientific journals as “unsustainable”[76] and this sentiment is also reflected in the National Energy Policy of Nigeria, which notes that demand for woodfuel is unsustainable and significantly greater than annual woodfuel supply.

The Forest Resources Assessment 2005 (FAO[77]) indicates that total forest resources declined by 36% from 1977 to 1994, as summarised in the following table.

Comparison of forested areas across Nigeria in 1977 and 1994. (‘000 Ha)
<table>
<tr><th></th><th>1977</th><th>1994</th></tr>
<tr><td>Dominantly Trees/Woodlands/Shrubs</td><td>15 292</td><td>8 252</td></tr>
<tr><td>Disturbed Forest</td><td>1 473</td><td>1 925</td></tr>
<tr><td>Undisturbed Forest</td><td>2 623</td><td>1 228</td></tr>
<tr><td>Mangrove Forest</td><td>1 010</td><td>1 012</td></tr>
</table>
</td></tr>
</table>

[75] FAO. 2003. Experience of Implementing National Forest Programmes in NIGERIA. EC-FAO PARTNERSHIP PROGRAMME (2000-2003): PAGE 42

[76] Gbadegesin, A. and Olo Savanna Zones of Nigeria: Implications for Forest Sustainability and Adaptation to Climate Change. Global Journal of Human Social Science 11(1). PAGE 55

[77] FAO, 2005 Global Forest Resources Assessment, Country Reports, Nigeria: ftp://ftp.fao.org/docrep/fao/010/ai919E/ai919E00.pdf PAGE 8

Montane Forest	683	685
Riparian Forest	748	533
Forest Plantation	101	159
Teak/Gmelina Plantation	63	117
Agricultural Tree Crop Plantation	84	166
Total	**22,077**	**14,077**

Supporting evidence is the trend in loss of forest from 1990 to 2010. The Global Forest Resources Assessment 2010[78] (FAO) indicates that total forest area declined by 48% from 1990 to 2010, as summarized in the following table.

Trends in extent of forest 1990-2010

Country/ area	Forest area (1 000 ha)				Annual change rate					
	1990	2000	2005	2010	1990-2000		2000-2005		2005-2010	
					1000 ha/yr	%[a]	1000 ha/yr	%[a]	1000 ha/yr	%[a]
Nigeria	17234	13137	11089	9041	-410	-2.68	-410	-3.33	-410	-4.00

In relation to this forest loss over time, the trend in carbon stock in living forest biomass has also reduced by approximately 46% over the 1990 to 2010 time period as summarized in the following table[79].

Trends in carbon stock in living forest biomass 1990-2010

Country/ area	Carbon stock in living forest biomass (million tonnes)					Annual change (million tonnes/ yr)			Annual change per hectare (t/ha/yr)		
	1990	2000	2005	2010	Per hectare 2010 (tonnes)	1990 – 2000	2000 - 2005	2005 - 2010	1990 - 2000	2000 - 2005	2005 - 2010
Nigeria	2016	1550	1317	1085	120	-47	-47	-46	n.s.	n.s.	n.s.

Vegetation cover in and around densely populated urban areas such as Lagos has declined steadily since the 1980's[80]; and the South and South West zones of Nigeria were once covered by tropical high forest, however, the area of undisturbed tropical high and lowland rainforest has decreased considerably due to exploitation for woodfuel, clearance for agriculture and urban settlements[81, 82, 83, 84]. Gbadegesin and Olorunfemi (2011) conducted a study

[78] http://www.fao.org/forestry/fra/fra2010/en/ GLOBAL TABLES, Table 3

[79] http://www.fao.org/forestry/fra/fra2010/en/ GLOBAL TABLES, Table 11

[80] Abiodun, O.E., Olaleye, J.B., Dokai, A.N., and Odunaiya, A.K. (2011) Land Use Change Analyses in Lagos State From 1984 to 2005. FIG Working week 2011, Bridging the Gap between Cultures. PAGE 6

[81] Chemonics International. (2008) Nigeria Biodiversity and Tropical Forestry Assessment: Maximising Agricultural Revenue in Key Enterprises for Targeted Sites (Markets). Available from: http://pdf.usaid.gov/pdf_docs/PNADN536.pdf. PAGE 36

[82] Aruofor, R. (2001) Forestry outlook study for Africa: Nigeria. Food and Agriculture Organisation of the United Nations. Available from: http://www.fao.org/DOCREP/004/AB592E/AB592E00.htm#TOC. Section "Demand for Forest Products"

[83] Aregheore, E.M. (2009) Nigeria Country Pasture/Forage Resource Profiles. Food and Agriculture Organisation of the United Nations. Available from: http://www.fao.org/DOCREP/004/AB592E/AB592E00.htm PAGE 18

[84] World Rainforest Movement. (2006) Nigeria: Tree plantations at the expense of forests and forest people's livelihoods. Available from: http://www.wrm.org.uy/bulletin/105/NIgeria.html PAGE 1

carried out in rain forest states of Osun and Ondo and the guinea savanna state of Niger in Nigeria to examine the socio-economic aspects of the fuel wood business with a view to highlighting the effects of government policy that the subsidy removal on petroleum products could have on forest sustainability and adaptation to climate change. The study involved administering questionnaire on households, institution and small scale business enterprises, fire wood sellers and transporters[85]. The study found that as a result of an increase in population over time and the rising cost of commercial fuels, the demand for fuelwood has increased and fuelwood collectors now have to travel longer distances to obtain firewood than they used to do as the fuelwood resources of the areas around settlements are now largely depleted. Woodfuel collection in both the forest and savanna regions is described as "unsustainable"[86] and this sentiment is also reflected in the National Energy Policy of Nigeria, which notes that demand for woodfuel is unsustainable and significantly greater than annual woodfuel supply.

Evidence suggests that there is a strong trend towards increased distance travelled by fuelwood dealers· Hyman[87] reports that demand outstripped supply across the country and that the deficit is met through long-distance transportation of fuelwood. Hyman's study focused on Northern Nigeria and comprised all of Bauchi, Borno, Kano, Kaduna, Katsina, and Sokoto states and part of Plateau State. Hyman's claim is also supported by FAO[88] fuelwood production and demand modeling results, showing that aggregate production at the national level shows a slight surplus over demand up till 1995. However, deficit sets in from year 2000, increasing appreciably over time. Furthermore, the deficit is more obvious in the Sudan and Guinea Savanna (where Kaduna and Kano are located), which currently experience shortfalls because of low production.

It is unlikely that trends in loss of carbon stocks and the time it takes to collect firewood are influenced by enforcement of rules and regulations, given the widespread challenges to implementing forestry laws in Nigeria. On the contrary, the lack of enforcement of forestry management has exacerbated widespread depletion of forest resources across Nigeria[89]. The Federal Ministry of Environment sets national policies, but responsibility for the implementation of forest management lies with each of the country's 36 states, each of which has its own forestry laws guided by those at federal level. At the state level, management capacity of the state forestry departments and local organizations is mostly low, with poor funding, low staff morale, limited technical training and often high levels of government corruption. Across the board at the state level, forest laws are often obsolete, and weakly enforced[90]. Management strategies

[85] Gbadegesin, A. and Olorunfemi, F. (2011) Socio-economic aspects of fuel wood business in the Forest and Savanna Zones of Nigeria: Implications for Forest Sustainability and Adaptation to Climate Change. Global Journal of Human Social Science 11(1). PAGE 54

[86] Gbadegesin, A. and Olorunfemi, F. (2011) Socio-economic aspects of fuel wood business in the Forest and Savanna Zones of Nigeria: Implications for Forest Sustainability and Adaptation to Climate Change. Global Journal of Human Social Science 11(1). PAGE 55

[87] Hyman, E. 1994. Fuel substitution and efficient woodstoves: Are they the answers to the fuelwood supply problem in Northern Nigeria? *Environmental Management* 18, no. 1. http://www.springerlink.com/content/4q86106135738360/ PAGE 1

[88] FAO, Experience of Implementing National Forest Programmes in NIGERIA, 2003: PAGE 42

[89] Chemonics International. (2008) Nigeria Biodiversity and Tropical Forestry Assessment: Maximising Agricultural Revenue in Key Enterprises for Targeted Sites (Markets). Available from: http://pdf.usaid.gov/pdf_docs/PNADN536.pdf. PAGE 37

[90] National Programme Document- Nigeria. Available on the UN-REDD website at: http://www.un-redd.org/PolicyBoard/7thPolicyBoard/tabid/54129/Default.aspx PAGE 22

are generally considered insufficient to maintain forest cover and conserve biodiversity[91,92,93,94] .

Therefore it is highly unlikely that enforcement of regulations is causing collection further away from areas where villagers would collect in the absence of any such regulations. Rather, collection from further distances is a result of deforestation.

Ghana

Non-renewable biomass has been in use since December 31, 1989 as evidenced by various FAO statistical data summarized below. Supporting evidence is the trend in loss of forest from 1990 to 2010. The Global Forest Resources Assessment 2010[95] (FAO) indicates that total forest area declined by 34% from 1990 to 2010, as summarized in the following table.

Trends in extent of forest 1990-2010

Country/ area	Forest area (1000 ha)				Annual change rate					
	1990	2000	2005	2010	1990-2000		2000-2005		2005-2010	
					1 000 ha/yr	%[a]	1 000 ha/yr	%[a]	1 000 ha/yr	%[a]
Ghana	7448	6094	5517	4940	-135	-1.99	-115	-1.97	-115	-2.19

In relation to this forest loss over time, the trend in carbon stock in living forest biomass has also reduced by approximately 32% over the 1990 to 2010 time period as summarized in the following table[96].

Trends in carbon stock in living forest biomass 1990-2010

Country / area	Carbon stock in living forest biomass (million tonnes)					Annual change (million tonnes/ yr)			Annual change per hectare (t/ha/yr)		
	1990	2000	2005	2010	Per hectare 2010 (tonnes)	1990 - 2000	2000 - 2005	2005 - 2010	1990 - 2010	2000 - 2005	2005 - 2010
Ghana	564	465	423	381	77	-10	-8	-8	n.s.	n.s.	n.s.

The Ghana Living Standard Surveys (GLSS) gives an opportunity for analyzing a trend that expands from 1991 to 2006 for the time it takes for collecting firewood. In 1991-92, approximately one-third of the population collected firewood. This has dropped to approximately one-quarter of the population in 2005-06; however, on average, the time it takes for a person to collect firewood has doubled during the

[91] Chemonics International. (2008) Nigeria Biodiversity and Tropical Forestry Assessment: Maximising Agricultural Revenue in Key Enterprises for Targeted Sites (Markets). Available from: http://pdf.usaid.gov/pdf_docs/PNADN536.pdf. PAGE 37

[92] Aruofor, R. (2001) Forestry outlook study for Africa: Nigeria. Food and Agriculture Organisation of the United Nations. Available from: http://www.fao.org/DOCREP/004/AB592E/AB592E00.htm#TOC. Section "Forestry policy, legislation and institutions"

[93] Usman, B.A. and Adefalu, L.L. (2010) Nigerian forestry, wildlife and protected areas: Status report. Biodiversity 11(3), 44 – 52. PAGE 50

[94] ITTO. (2009) Encouraging Industrial Forest Plantations in the Tropics - Report of a Global Study. International Tropical Timber Association. Available from: http://www.itto.int/direct/topics/topics_pdf_download/topics_id=2165&no=0&disp=inline. PAGE 68

[95] http://www.fao.org/forestry/fra/fra2010/en/ GLOBAL TABLES, Table 3

[96] http://www.fao.org/forestry/fra/fra2010/en/ GLOBAL TABLES, Table 11

period from 1991 to 2006.

Although it is difficult to interpret these results in the absence of qualitative data and surveys, it can be deducted that they are correlated to less need to resort to wood for cooking as some households move to more modern cooking fuels. Yet, for those households that did not transition to modern fuels and did not benefit from improvements in equipment (such as improved stoves for instance), they had to increase their walking distance to satisfy their fuelwood needs, because of deforestation[97].

Trends in Firewood Collection in Ghana, 1991-92[1] and 2005-06[2]

		Number of persons involved (%)		Number of minutes per day and per person					
				Rural		Ghana		Urban	
		1991-92	2005-06	1991-92	2005-06	1991-92	2005-06	1991-92	2005-06
Firewood Collection	Female	43	37.5	9	26	29	31	22	30
	Male	24	16.9	4	25	11	24	9	25
	All	34	27.6	7	26	21	29	16	29

Source: Based on Ghana Living Standards Surveys

The majority of Ghana's remaining forest cover is within the country's Forest Reserves (FRs), which are legally protected from firewood collection and charcoal production.

However, illegal exploitation and encroachment of FRs is a widespread and long-established trend[98]. An assessment of the health of Ghana's FRs conducted in 1995 found that overall only ~15% were in 'good' or 'excellent' condition, while ~15% were found to be in 'very bad' condition, and ~56% found to be 'partly' or 'mostly degraded'[99]. Wet/moist evergreen FRs were found to be the only categories with significant remaining area of undisturbed forest, whereas savanna FRs in the more arid regions such as Northern, Upper West and Upper East are virtually all degraded[100]. Observations of satellite imagery support the suggestion that FRs in the arid north of Ghana are particularly badly degraded[101].

Although FRs are protected, the majority have become degraded. Therefore it is highly unlikely that enforcement of regulations is causing collection further away from areas where villagers would collect in the absence of any such regulations. Rather, as indicated in a World Bank report[102], collection from further distances is a result of deforestation.

Senegal	Non-renewable biomass has been in use since December 31, 1989 as evidenced by various FAO statistical data summarized below. Supporting evidence is the

[97] Blackden, Mark C. and Wodon, Quentin. Ed. Gender, Time Use, and Poverty in Sub-Saharan Africa. The World Bank. World Bank Working Paper, No. 73. 2006. PAGE 56

[98] EPA. (2002) National Action Programme to Combat Drought and Desertification. Environmental Protection Agency, Accra, Ghana. Available from: http://epa.gov.gh/ghanalex/policies/NAP.pdf. PAGE 72

[99] Hawthorne, W.D. and Abu-Juam, M. (1995) Forest protection in Ghana: with particular reference to vegetation and plant species. IUCN Forest Conservation Programme, Great Britain. PAGE 15

[100] Hawthorne, W.D. and Abu-Juam, M. (1995) Forest protection in Ghana: with particular reference to vegetation and plant species. IUCN Forest Conservation Programme, Great Britain. PAGE 15

[101] UNEP. (2007) Republic of Ghana Atlas. Available from: http://www.unep.org/pdf/PressReleases/Ghana_Africa_Atlas.pdf.

[102] Blackden, Mark C. and Wodon, Quentin. Ed. Gender, Time Use, and Poverty in Sub-Saharan Africa. The World Bank. World Bank Working Paper, No. 73. 2006. PAGE 56

trend in loss of forest from 1990 to 2010. The Global Forest Resources Assessment 2010[103] (FAO) indicates that total forest area declined by 10% from 1990 to 2010, as summarized in the following table.

Trends in extent of forest 1990-2010

Country / area	Forest area (1 000 ha)				Annual change rate					
					1990-2000		2000-2005		2005-2010	
	1990	2000	2005	2010	1 000 ha/yr	%[a]	1 000 ha/yr	%[a]	1 000 ha/yr	%[a]
Senegal	9348	8898	8673	8473	-45	-0.49	-45	-0.51	-40	-0.47

In relation to this forest loss over time, the trend in carbon stock in living forest biomass has also reduced by approximately 10% over the 1990 to 2010 time period as summarized in the following table[104].

Trends in carbon stock in living forest biomass 1990-2010

Country / area	Carbon stock in living forest biomass (million tonnes)					Annual change (million tonnes/yr)			Annual change per hectare (t/ha/yr)		
	1990	2000	2005	2010	Per hectare 2010 (tonnes)	1990-2000	2000-2005	2005-2010	1990-2000	2000-2005	2005-2010
Senegal	377	357	348	340	40	-2	-2	-2	n.s.	n.s.	n.s.

Over the last few years, local populations have witnessed a constant tendency towards depletion of natural resources under current management systems. More specifically, the distance local populations have to travel in order to collect wood for cooking has increased. while at the same time, charcoal is becoming more and more widespread in rural areas where wood is normally the preferred domestic fuel[105]. This suggests that local population find it increasingly difficult to find wood for cooking because of an accelerating depletion of natural resources.

This evidence of fuel-switch in rural areas be-cause of the intensive use of non-renewable biomass is also highlighted by Masera et al. “charcoal is becoming a preferred fuel by villages due to the increasing distance of stocked woodlands that limits self-gathering and other socio-economic factors[106].

In the period, 1991-2005, it is estimated that between 25,000 hectares and 30,000 hectares of forest were lost annually for the production of charcoal alone[107]. More-over, the total forest cover in the country decreased from 14,649 million hectares in

[103] http://www.fao.org/forestry/fra/fra2010/en/ GLOBAL TABLES, Table 3

[104] http://www.fao.org/forestry/fra/fra2010/en/ GLOBAL TABLES, Table 11

[105] Programme Regional de Promotion des Energies Domestiques et Alternatives au Sahel (PREDAS) (Regional Promotion Program for Household and Alternative Energies in the Sahel), Energies et Femmes au Sahel. Cas du Senegal. Republique du Senegal. November, 2006. Page 2, paragraph 4

[106] Masera, O. et al, “WISDOM : a GIS-based supply demand map-ping tool for wood-fuel management” Biomass and Bio-energy, Vol. 30 (2006), page 618-637, page 633, table 5.

[107] “Country Study: Senegal”, 4th Draft, 2003, page 16, paragraph 2 ; Plan de convergence pour la gestion et l’utilisation dura-bles des Ecosystemes forestiers en Afrique de l’Ouest, rapport Sengal (Convergence Plan for the Management and Sustainable Use of Forest Ecosystems in Western Africa), page 18, table 7

	1990 to 13,384 million hectares in 2010, which suggest a continued use of non-renewable biomass without appropriate re-stocking practices[108]. In the effort to implement sustainable management practices and reduce the pressure on forest resources, The Directorate of Water Affairs and Forestry allocates an annual quota for the production of charcoal. However, the quota allocation policy is failing for two main reasons. First, the rights to charcoal production have been mainly assigned to urban-based traders so that, over time, the practice created an oligopolistic industry and negative environmental effects[109]. Secondly, the demand for charcoal for cooking is extremely high in Senegal especially for urban consumption so that the quotas are yearly exceeded illegally and charcoal is regularly produced outside the quota system. For instance, in 2004 the national quota for charcoal production was 50,000 tonnes[110] but, in reality, the charcoal demand is estimated to be over 400,000 tonnes per year[111]. The Centre de Suivi Ecologique clearly states that the lack of appropriate forest management, poor reforestation efforts, increasing woodfuel demand and the inefficient quota system are all factors contributing towards the depletion of renewable biomass in Senegal[112]. Therefore, it can be concluded that woody biomass is being depleted in Senegal irrespective of the existence and enforcement of regulations or laws that would prevent the collection of wood to happen.
Malawi	Non-renewable biomass has been in use since December 31, 1989 as evidenced by various FAO statistical data. As referred in the report prepared by C4 EcoSolutions[113], forest management effectiveness is an important consideration in estimating MAI because disturbance decreases the rate of growth (Agrawal & Angelsen 2009; Chidumayo 2009). A significant trend of declining forest regeneration and accelerating deforestation and degradation has been observed in Malawi. Jagger & Perez-Heydrich (2016) characterised the types of land cover change that occurred between two time periods – 2001 to 2004 and 2004 to 2010. They report a decrease in the proportion of this change attributable to forest regeneration from 18% to 8%. They further report a concurrent increase in the change attributable to deforestation and degradation from 17% to 27%. Similar trends have been observed in neighbouring countries such as Zambia (Kalaba 2016), Tanzania (Kideghesho 2015) and Mozambique (Sedano et al. 2016). Productivity estimates based on broad, continental generalizations can, therefore, be expected to overestimate reality in Malawian forests. Observations of regional Miombo growth rate and biomass density were used to calculate the MAI for Malawi. Stromgaard (1985) and Malimbwi et al. (1994) recorded average biomass densities of 39.6 and 32.9 t/ha in Zambian and Tanzanian Miombo, respectively. Chidumayo (2009) provides a more recent longitudinal analysis, recording similar results with an average biomass density of 28.25 t/ha and annual growth rate of 2.1%. The product of the average biomass density and annual growth rate results in a MAI of 0.70 t/ha/yr (Table 3).

[108] Plan de Convergence pour la Gestion et l'Utilisation Durables des Ecosystemes Forestiers en Afrique de l'Ouest (Convergence Plan for the Management and Sustainable Use of Forest Ecosystems in Western Africa), Rapport Sengal, table 7, Page 8, figure 2

[109] Second Sustainable and Participatory Energy Management, Project, World Bank, 2010

[110] Les Investissements Prives dans le Sous-Secteur Forestier, May 2012

[111] SIE, 2007, Figure 30, page 31

[112] Rapport sur l'etat de l'environnement, 2005, Centre de suivi ecologique, page 139

[113] C4 EcoSolutions: Calculating the National Non- Renewable Biomass fraction (fNRB)

In view of the combined evidence of declining forested areas, trend in loss in carbon stock since 1985, trend in the increased length of time spent for collecting firewood, and presently such a high fraction of non-renewable biomass, it may be deducted that the majority of fuelwood used across Malawi was from non-renewable sources.
It is now estimated that the fraction of non-renewable biomass in total biomass is 94 percent
In view of the combined evidence of declining forested areas, trend in loss in carbon stock since 1985, trend in the increased length of time spent for collecting firewood, and presently such a high fraction of non-renewable biomass, it may be deducted that the majority of fuelwood used across Malawi was from non-renewable sources.
It is now estimated that the fraction of non-renewable biomass in total biomass is 94 percent.

Zambia

About 60 per cent of the population in Zambia live in poverty and depend mainly on wood collected from forests for fulfilling their energy needs. It is not surprising therefore that biomass accounts for nearly 77% of nation's energy needs. According to Chidumayo 2005[114] 'Harvesting of wood from forests in Zambia for wood/charcoal energy is largely under poor forest management practices and therefore unstainable, such that areas remain deforested. Consequently, the biomass originating from forests can be considered non-renewable'

The following table shows wood biomass in regrowth miombo woodlands of Central Zambia at different rotation periods.

Table 2.1: Estimated above ground wood biomass at different rotation periods (Chidumayo 2005)

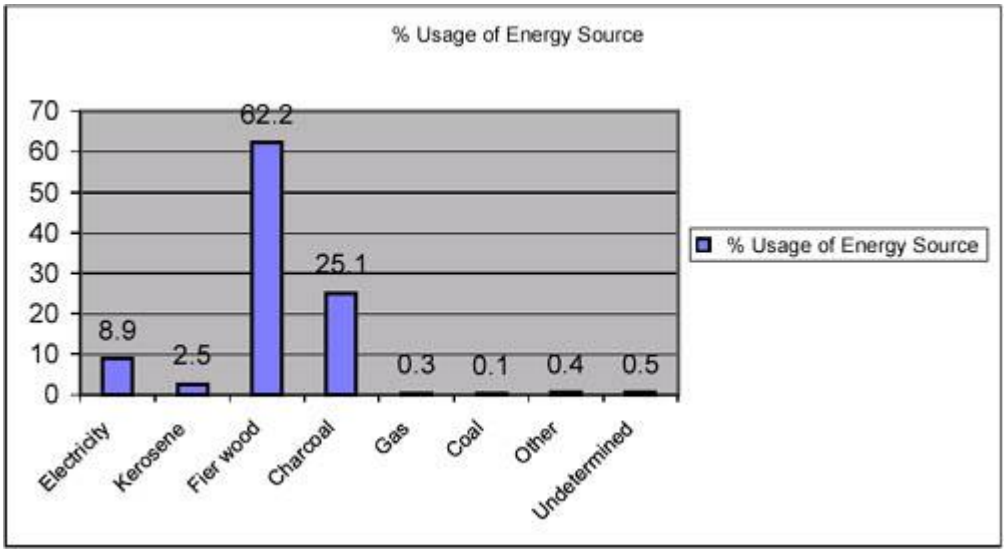
Forest management phase	Wood biomass (tonnes/hectare) at different rotation periods				
	20 years	30 years	40 years	50 years	100 years
Good management (pre-1980s)	67 ± 40	85 ± 40	94 ± 41	98 ± 43	103 ± 51
Declining management (1980s)	45 ± 14	57 ± 15	64 ± 15	71 ± 15	90 ± 17
No management (1990s to date)	20 ± 11	27 ± 12	31 ± 13	35 ± 13	46 ± 17
Difference with good (sustainable) management (reference scenario)					
Declining management 1981 – 1989)	22	28	29	28	14
No management (1990 – 2000)	47	58	62	64	58

On an average, the annual rate of forest loss in Zambia is between 250,000 ha and 300,000 ha/year (PEZP, 1998). Other studies indicate an annual average loss of up to about 850000 ha. A UN-REDD report based on an analysis of seven studies dating from 1969–2006, provides a deforestation estimate of 298,000 ha per year (Kamelarczyk 2009). FAO, 2001 indicate that in 1990 total forest cover was 39,755,000 ha and reduced to 31,346,000 ha by the year 2000. Forests in Zambia are being cut or destroyed without a clear knowledge of all the consequences and without a commitment to sustainable use.

Change in Forest Cover[115]		
Forest 1990 (ha)	49,124,000	
Forest 2000 (ha)	44,676,000	
Forest 2005 (ha)	42,452,000	
	Ha	%
Annual Change 1990-2000	(444,800)	-0.91%
Annual Change 2000-2005	(444,800)	-1.00%
Total Change 1990-2005	(6,672,000)	-13.58%

[114] https://www.unece.org/fileadmin/DAM/energy/se/pdfs/gee21/projects/others/ECA.pdf (page 17)

[115] https://rainforests.mongabay.com/deforestation/archive/Zambia.htm

	Change in rate (%) | 9.96% Figure 3: Percentage of HH using different energy sources for cooking[116]  Source CSO, 1990 Annual increases in runoff rates of 10-18% have been reported, while decreases in evapo-transpiration due to canopy removal has increased base flow and ground water storage in Miombo woodlands (Sharma, 1985 in Chidumayo1994) The increase in runoffs has resulted in high soil erosion currently experienced in the country[117]. In light of above, it is evident that major losses have been reported in forest areas from before 1989 thereby hinting at the use of non-renewable biomass and also that majority of fuelwood used across Zambia comes from non-renewable sources.
Zimbabwe	Zimbabwe has high dependency on wood for energy, particularly in rural areas. About 70 percent of Zimbabwe's energy consumption is derived from wood energy. This high figure is related to the fact that approximately 70 percent of the country's population is rural based, often with poor access to electrical supply. Even where rural electrification has occurred, income constraints prevent many households from connecting to the grid. These households continue to consume fuelwood for energy because of its perceived status as a free good. As a result, Zimbabwe has witnessed severe deforestation over past several decades. The area of indigenous woodland in Zimbabwe has shown a continuous decline in the past decade. Between 1985 and 1996 the woodlands of Zimbabwe were depleted at an average rate of 2.01 percent per annum. Overall, biomass depletion has been taking place at a uniform rate of 30.1 million tonnes per annum between 1985 and 1996. This decline could be attributed to fuelwood harvesting which became a major contributing factor for deforestation, rated as the most serious environmental issue in the country during a 1992 national survey by the Ministry of Environment and Tourism (Marongwe and Milne, 1993).

[116] http://www.fao.org/docrep/ARTICLE/WFC/XII/1022-B1.HTM

[117] http://www.fao.org/docrep/ARTICLE/WFC/XII/1022-B1.HTM

Decline in growing stock between 1985-1996[118]

Biomass Type	Growing Stock (million of tonnes)				
	1985	1996	Gross Change	Annual Change	% Change per Year
Woodlands	1278.00	1038.10	-239.90	-21.80	-1.71
Bushland	214.10	116.20	-97.90	-8.90	-4.14
Wooded Grassland	7.60	13.70	6.10	0.55	7.23
Total	1499.70	1168.00	-331.70	-30.10	-2.01

Thus, it can be concluded that major losses have been reported in forest areas from before 1989 thereby hinting that majority of fuelwood used across Zimbabwe comes from non-renewable sources.

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

This section has been left blank intentionally.

Appendix 5. Further background information on monitoring plan

Refer to Part II Section I.7.2.

Appendix 6. Summary report of comments received from local stakeholders

Refer to Part I Section F.3

Appendix 7. Summary of post-registration changes

Approved on 02/07/2018

a) Changes to the programme boundary to expand the geographical coverage or to include additional host Parties.

Malawi is included as additional boundary to the PoA and the relevant sections/information in PoA-DD which includes Local Stakeholder Consultation, f_{NRB} and B_{old} are updated accordingly.

b) Changes to monitoring plan

During the registration, the sampling method applied in the monitoring plan is multi-stage sampling. Multi-stage sampling is a sophisticated method which is not easy to be implemented and the data analysis is difficult. Given that the population being studied is relatively homogeneous with respect to the parameter being studied, therefore simple random sampling is chosen to replace the existing

[118] http://www.fao.org/tempref/docrep/fao/005/AB603E/AB603E00.pdf (page 15)

sampling method. Accordingly, sampling frame, sampling method and sample size calculation of monitoring plan is revised with information correlated with simple random sampling.

c) Addition of project participant

Ecoeye Co., Ltd is added as new project participant to the PoA and its detail is updated accordingly in PoA-DD.

d) Change in project design

During the registration, each CPA was considered as small scale project activity and Methodological tool: "Demonstration of additionality of small-scale project activities" was applied for the CPA. That tool restricts to include the ICS upto a threshold energy saving 180 GWH_{th}/year for each CPA. While under applicability of the Methodological tool: "Demonstrating additionality of microscale project activities" the threshold energy saving of 600 MWh is required for each unit installed for domestic purpose. This condition is applicable for all the ICSs (units) under the PoA. Therefore the applicable tool for demonstration of additionality of small-scale project activities is replaced with the tool for demonstrating additionality of microscale project activities.

Approved on 22/01/2019

a) Changes to the programme boundary to expand the geographical coverage or to include additional host Parties.

Zambia is included as additional boundary to the PoA and the relevant sections/information in PoA-DD which includes Local Stakeholder Consultation, f_{NRB} and B_{old} are updated accordingly.

b) Change in Monitoring Plan to enhance clarity and transparency

The present monitoring plan lacked clarity on identification of primary sampling units for each of the three parameters: a) proportion of ICS still in operation (***ny,j***); b) percentage of continued baseline stove use among ICS households (***SSy***) and c) efficiency of operational ICS ($\boldsymbol{\eta_{new,i}}$). The change makes it clear; that for parameters $n_{y,j}$ and SS_y, there will only be a single sampling unit if the country in which CPAs are implemented and fuel using cluster is same, as change in model of the project cookstove or the vintage do not affect these parameters. For parameter $\boldsymbol{\eta_{new,i}}$, primary sampling units shall be defined on the basis of stove model and vintage in addition to CPAs belonging to same country and fuel using cluster. The above changes will not result in any material change in sampling or monitoring plan but will add further clarity on determination of primary sampling units.

c) Change in eligibility criteria for inclusion of CPA

Change in eligibility criteria no 12 to include the option of using published historical data for determining B_{old} value.

Approved on 01/10/2019

a) Changes to the programme boundary to expand the geographical coverage or to include additional host Parties.

Zimbabwe is included as additional boundary to the PoA and the relevant sections/information in PoA-DD which includes Local Stakeholder Consultation, f_{NRB} and B_{old} are updated accordingly.- - - - -

Document information

Version	*Date*	*Description*
09.0	31 May 2019	Revision to: • Ensure consistency with version 02.0 of the "CDM project standard for programmes of activities" (CDM-EB93-A07-STAN); • Make editorial improvements.
08.1	28 June 2017	Revision to: • Remove a duplicated instruction; • Make editorial improvement.
08.0	7 June 2017	Revision to: • Improve consistency with the "CDM project standard for programmes of activities" and with the PDD and CPA-DD forms; • Make editorial improvement.
07.0	25 May 2017	Revision to: • Ensure consistency with the "CDM project standard for programmes of activities" (CDM-EB93-A07-STAN) (version 01.0); • Incorporate the "Programme design document form for small-scale CDM programmes of activities" (CDM-SSC-PoA-DD-FORM); • Make editorial improvement.
06.0	15 April 2016	Revision to ensure consistency with the "Standard: Applicability of sectoral scopes" (CDM-EB88-A04-STAN) (version 01.0).
05.0	9 March 2015	Revision to: • Include provisions related to choice of start date of PoA; • Include provisions related to delayed submission of a monitoring plan; • Provisions related to local stakeholder consultation; • Add exception for generic CPA where technology is under positive lists; • Make editorial improvement.
04.1	5 August 2014	Editorial revision to correct the document information table.
04.0	25 June 2014	Revision to: • Include the Attachment: Instructions for filling out the project design document form for CDM programme of activities (these instructions supersede the Guideline: Completing the programme design document form for CDM programme of activities (Version 04.0)); • Include provisions related to standardized baselines; • Add contact information on a responsible person(s)/ entity(ies) for the application of the methodology (ies) to the PoA in B.4 and Appendix 1; • Add general instructions on post-registration changes in paragraphs 2 and 3 of general instructions and Appendix 6; • Change the reference number from F-CDM-PoA-DD to CDM-PoA-DD-FORM; • Make editorial improvement.

Version	*Date*	*Description*
03.0	3 December 2012	EB 70 Revision to reflect changes to the *Guideline: Completing the programme design document form for CDM programmes of activities* (EB 70, Annex 6).
02.0	13 March 2012	EB 66 Revision required to ensure consistency with the "Guidelines for completing the programme design document form for CDM programmes of activities" (EB 66, annex 12).
01.0	27 July 2007	EB 33, Annex 41 Initial publication.

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