PROGRAMME DESIGN DOCUMENT FORM FOR SMALL-SCALE CDM PROGRAMMES OF ACTIVITIES (F-CDM-SSC-PoA-DD) Version 02.0

PROGRAMME OF ACTIVITIES DESIGN DOCUMENT (PoA-DD)

PART I. Programme of activities (PoA)

SECTION A. General description of PoA

A.1. Title of the PoA

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Improved Cookstoves Program for Malawi and cross-border regions of Mozambique

Version 09
08/03/2014

A.2. Purpose and general description of the PoA

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1. General operating and implementing framework of SSC-PoA

This Small-Scale Programme of Activities (SSC-PoA) involves the promotion, distribution / installation of fuel-efficient improved cook stoves (ICS) in Malawi and will, at a later stage, include cross-border regions in Mozambique[1]. The ICS disseminated through this programme will replace the prevailing inefficient three-stone fires or traditional pot support with stoves that combust firewood[2] 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 the Coordinating Managing Entity (CME) of this SSC-PoA. ICS will be distributed / installed on a commercial or a non-commercial basis by CPA Implementers[3]. Carbon finance will be used to facilitate the purchase, distribution[4] 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 user will, via the Registration Card[5], confirm its agreement to transfer the rights to the carbon credits or certified emission reductions (CERs) generated to the CME[6] 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 (eg. 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.

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[1] At time of writing, the PP and the CME weren't fully prepared to include the host country Republic Mozambique in the SSC-PoA, so it will add Mozambique to the SSC-PoA once: 1) a baseline study is done, 2) the CPA implementer is ready to implement a CPA, and 3) the PP or the CME is granted with a LOA from the Mozambican government. Therefore, this SSC-PoA-DD will deal exclusively with Malawi and will be revised post registration once the CME, validated by a DOE, includes Mozambique.

[2] This SSC-PoA is focusing exclusively on wood as fuel and does not encompass charcoal as fuel for cooking

[3] 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 Part II Section A..

[4] 'Distribution' in this SSC-PoA-DD is taken to include sales.

[5] The term 'Registration Card' as used in this SSC-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). Information contained in the Registration Card and means of transferring this to the CME is explained in "Data Collection and Transfer" in Part II Section A.

[6] The method for collecting this information is further elaborated on Part II Section A. *Users' participation on the SSC-PoA, transfer of Carbon Rights to the CME and use of baseline stove*

2. Policy/measure or stated goal of the SSC-PoA

The goal of this SSC-PoA is to make cleaner, more efficient improved cook stoves more affordable and available to rural households, across Malawi[7], who at present, use simple three stone fires or traditional pot supports that are inefficient and smoky in burning firewood. In turn, this will reduce global greenhouse gas emissions by increasing the efficiency of cooking and reducing the quantity of non-renewable 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 proposed SSC-PoA will deliver a long-term, secure and simple contribution to sustainable development in Malawi that, without carbon finance, would not exist. ICSs to be distributed under this SSC-PoA may be locally made/built or may be imported from outside the country, including Annex I countries. Thus, technology transfer is envisaged and considered under this SSC-PoA.

3. Confirmation that the proposed SSC-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 mandatory targets in the country listed[8] in this SSC-PoA stipulating the adoption of ICS by households. The country may, nevertheless, have policies to promote or encourage the dissemination of ICS.

4. Contribution to sustainable development

The prevalence of firewood to fulfil cooking needs is ubiquitous in Malawi where 88% to 91% of households are using firewood and 7 to7.9% using charcoal,[9,10] as the main cooking fuel. The use of firewood is most significant in rural areas where 95.2% of the energy is obtained from this fuel[11].

The use of inefficient cooking 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[12] 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[13]. Where wood is purchased or collected, it poses a significant financial burden on families. Malawi is one of the

[7] Urban areas in Malawi are defined as per the United Nations Demographic Yearbook as "All townships and town planning areas and all district centres". In order to increase clarity, the CME defined rural communities as areas outside of urban boundaries of towns, townships, district centers and cities of population greater than 4765 – the lowest population number found in the classification" cities, towns, villages" as per the website (http://www.citypopulation.de/Malawi.html (last visited on 14/12/2012). Rural areas are characterized by lack of infrastructure such as shops, hospitals, good roads. Therefore, only households residing in areas outside of the urban areas as described here will be considered rural households and therefore targeted and eligible for CERs under this SSC-PoA.

[8] As indicated above, at time of Registration, the only country included in this SSC-PoA is Malawi. The CME plans to include Mozambique at a later stage (post-registration)

[9] Kambewa, P. and Chiwaula, L. Biomass Energy Use in Malawi pg 11- http://pubs.iied.org/pdfs/G03075.pdf (last visited March, 2012)

[10] Malawi 2008 Population and Housing Census. Percentages estimated from Table3.9

[11] Malawi Biomass Energy Strategy 2009. Page 27

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

[13] 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.

world's poorest countries, ranking 171th out of 187 countries on the Human Development Index.[14] About 74 per cent of the population in Malawi still live below the income poverty line of US$1.25 a day[15].

The inefficient use of wood also places considerable and unnecessary pressure on local ecosystems and biomass resources, including forests. Reducing consumption of firewood can reduce this pressure with immediate effects as compared with the lag time to plant and manage trees to a harvestable age, usually 6 years or more.

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

i. Environmental

- The SSC-PoA will help to significantly reduce greenhouse gas emissions over its lifetime.
- The SSC-PoA will help to reduce the use of non-renewable biomass from forests in Malawi, thereby assisting in the maintenance of existing forest stock, while protecting natural forest eco-systems and wildlife habitats.
- The protection of standing forests will also help to 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, especially women and girls who are charged with this task, and providing alternative opportunities for economic development as well as education (more time for girls to attend school)
- 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 decrease in total biomass burned and an increase in the temperature of combustion.
- The ICS provides a safer method for combusting biomass for cooking, helping to reduce burn injuries, especially for children, in the family home

iii. Economic

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

The proposed SSC-PoA will deliver a long-term, secure and simple contribution to sustainable development in Malawi that, without carbon finance, would not exist.

A.3. CMEs and participants of PoA

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

[14] http://hdr.undp.org/en/statistics/ Accessed November 2012

[15] http://www.ruralpovertyportal.org/web/guest/country/home/tags/malawi Accessed April 2012

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 SSC-PoA. Project participants may or may not be involved in one of the CPAs related to the SSC-PoA.

C-Quest Capital Malaysia Global Stoves Limited (CQC) and Total LandCare (TLC) Malawi 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.

A.4. Party(ies)

Name of Party involved (host) indicates a host Party	Private and/or public entity(ies) project participants (as applicable)	Indicate if the Party involved wishes to be considered as project participant (Yes/No)
Republic of Malawi (host)	Total LandCare (TLC) Malawi	No
Netherlands	C-Quest Capital Malaysia Global Stoves Limited (CQC)	No

A.5. Physical/ Geographical boundary of the PoA

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The SSC-PoA will be implemented in the Republic of Malawi[16]. The boundaries will be the geographic borders of the Republic of Malawi.

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

Note: geographical coordinates obtained from Google Earth®

A.6. Technologies/measures

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The activities under the proposed SSC-PoA will promote improved cook stoves that result in reduced fuel

[16] As previously explained, it is the intention of the CME to later (post Registration) add Mozambique to the SSC-PoA

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.

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. v05). 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 SSC-PoA, ICS can be classified using the following key characteristics:

1. **Construction material** - Improved Cookstoves are commonly made of single 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 SSC-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 SSC-PoA-DD. Specific stoves types will be described for each SSC-CPA.

Picture (example)	Category	Material	Portability
	Improved Mud/brick Stoves	Clay, straw, dung, cement, stone, bricks	Fixed (in-situ)
	Improved metal and ceramic stove	Metal with ceramic combustion chamber	Portable

A.7. 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 SSC-PoA, or any CPA under the proposed SSC-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)[17].

SECTION B. Demonstration of additionality and development of eligibility criteria

B.1. Demonstration of additionality for PoA

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The information presented here shall constitute the demonstration of additionality of the SSC-PoA as a whole.

1. The proposed SSC-PoA is a voluntary coordinated action;

It is hereby confirmed that the proposed SSC-PoA is a voluntary coordinated action by CQC. While there is generally supporting policy for energy efficiency initiatives, there is no mandated government programme or policy in the host country of this SSC-PoA ensuring the distribution of domestic fuel-efficient cook stoves[18]. Households may only participate voluntarily in this SSC-PoA.

2. If the SSC-PoA is implementing a voluntary coordinated action, it would not be implemented in the absence of the SSC-PoA;

Significant capital is required to invest in a programme which could match the achievements of this proposed SSC-PoA, including for import of technologies, developing the brand, widespread marketing, and establishing a distribution and retail network. CQC has been unable to find investors willing to provide the level of capital necessary to implement such a program without the hard-currency revenues from selling CERs. CQC's team of investors, which have key roles in providing both debt and equity in the ICS initiative, have all provided letters stating that they would not consider this kind of investment unless this SSC-PoA is CDM registered and eligible to sell CERs. CQC has been unable to find any other investors in this project, given the risks of doing this kind of project. One private investor states, for example, that "Appropriate structuring of the cash flows of

[17] 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 comprisedisbursements by bilateral donors and multilateral institutions (*OECD Glossary of Statistical Terms*)

[18] There are three main policies that have bearings on biomass energy availability and utilisation in Malawi (Kambewa, P. and Chiwaula, L. Biomass Energy Use in Malawi - http://pubs.iied.org/pdfs/G03075.pdf (last visited March, 2012)). These policies include the National Energy Policy, Forestry Policy and the Biomass Energy Strategy. The objectives of the Malawi energy policy include improving efficiency and effectiveness of the commercial energy supply industries; improve the security and reliability of energy supply systems; increase access to affordable and modern energy services; stimulate economic development and rural transformation for poverty reduction; improve energy sector governance; and mitigate environmental, safety, and health impacts of energy production and utilisation. The forestry policy is concerned with production of wood resources in man-made plantations, woodlots, and natural woodlands. On the other hand, the Malawi Biomass Energy Strategy's overall objective is to ensure a sustainable supply of affordable woodfuels. This documents mention that "Efforts may be made to scale up the promotion of rural woodstoves, but only after independent verification of the results of existing dissemination programmes" (Government of Malawi. Malawi Biomass Energy Strategy 2009. Page 100 http://www.euei-pdf.org/sites/default/files/files/field_pblctn_file/EUEI%20PDF_BEST_Malawi_Final%20report_Jan%202009_EN.pdf (last visited March 2012)) confirming that despite some level of effort been made to promote ICS in Malawi, no mandatory targets/policies are in place.

the carbon offsets will be essential to ensure the financing and economics feasibility and thus the 'finance ability' of the project."

3. **If the SSC-PoA is implementing a mandatory policy/regulation, this would/is not enforced;**
Not applicable since there is no mandatory policy/regulation in Malawi for the distribution of ICS. Hence, the SSC-PoA is not implementing a mandatory policy/regulation.

4. **If mandatory a policy/regulation are enforced, the SSC-PoA will lead to a greater level of enforcement of the existing mandatory policy/regulation;**
Not applicable since there is no mandatory policy/regulation in Malawi for the distribution of ICS.

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

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SSC-CPAs to be included under this SSC-PoA must fulfill the following eligibility criteria[19]:

1. Promote and install / distribute ICS in/to residential households in rural areas that use wood fuel following the SSC-PoA specifications[20];
2. Be implemented within the geographical boundary of the Republic of Malawi;
3. Have a maximum energy saving of 180 GWH_{th}/year throughout the CPA's crediting period to conform with the SSC threshold for type II projects as per EB 61 Annex 21 paragraph 3[21];
4. Have a database that will uniquely identify and define households in which ICS have been installed or distributed[22]. In addition, each stove itself will be uniquely identified with a serial number given by the manufacturer;
5. Comply with the applicability conditions set out in the methodology AMS II.G version 5 "Energy efficiency measures in thermal applications of non-renewable biomass" and further described in Part II Section B.2 of this SSC-PoA-DD;
6. 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+[23]) 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) [24];
7. Not be registered as individual CDM project activities nor included in another registered SSC-SSC-PoA, as well as in any other voluntary carbon scheme (such as Gold Standard, VCS, VER+);
8. Be approved by the CME prior to its incorporation into the SSC-PoA;
9. Be able to provide documentary evidence of the start date[25];
10. 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)[26];

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[19] PoA-specific requirements stipulated by the CMEs related to undertaking local stakeholder consultation and environmental impact analysis (EIA) are not applicable as eligibility criteria because both stakeholder consultation and EIA are carried out at SSC-PoA level.

[20] The CME will not certify or test any specific organization, but it reserves the right, at its sole discretion, to choose CPA implementers based on its track-record and ability to successfully distribute/installed 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.

[21] At time of inclusion, the CME shall provide the DOE with the calculation as per Part II Section A of the SSC-PoA-DD demonstrating what the maximum number of ICSs is for that CPA so it remains below the small-scale threshold.

[22] Part II Section A of the SSC-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.

[23] VER+ is TÜV SÜD's standard for voluntary emission reductions.

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

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

[26] 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.

11. 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 Water Boiling Test (WBT) outlined in AMS IIG, Version 5 approved by the CDM Executive Board). Alternatively manufacturers' specifications may be used;
12. Use baseline fuel consumption (B_{old}) data from the household fuel survey (as per baseline report uploaded together with the SSC-PoA-DD and further described in Part II, Section B.6.3 of the SSC-PoA-DD);
13. Use the national average non-renewable biomass (NRB) fraction as outlined in EB 67 Annex 22.;
14. Ensure that the CPA meets the criterion for not being a de-bundled component of a larger project activity and is additional - the debundling rule does not apply if the ICS as an independent subsystem, does not exceed 1% of the SSC threshold[27] (as per guidance EB54 Annex 13 and clarification SSC_233) and a CPA is additional if the ICS does not exceed 5% of the SSC threshold (as per guidance of EB68 Annex 27)[28];
15. 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[29];
16. Adhere to all requirements related to sampling for a SSC-PoA in accordance with Part II section B.7.2 of the SSC-PoA-DD;
17. Involve the promotion and distribution / installation of ICS through direct distribution/installation, delivery, community distribution events, or through commercial/retail outlets;

B.3. Application of methodologies

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The AMS-II.G methodology pertains to appliances involving the efficiency improvements in the thermal applications of non-renewable biomass. Examples of these technologies and measures include the introduction of high efficiency biomass fired cook stoves or ovens or dryers and / or improvement of energy efficiency of existing biomass fired cook stoves or ovens or dryers.

The SSC-PoA complies with the applicability criterions as per paragraphs 2, 3 and 29 of AMS.II.G. (version 5) as described below in Part II Section B.2.

In addition, the sampling plan for the CPAs under this PoA was developed after the Standard for Sampling and Surveys for CDM Project Activities and Programme of Activities version 3.0 (EB 74 Annex 6) and the Guidelines for Sampling and Surveys for CDM Project Activities and Programme of Activities version 2.0 (EB 69 Annex 5). This sampling plan is outlined in Section B.7.2 of Part II below

[27] At time of CPA inclusion the CME shall provide the DOE with the calculations as per Part I Section C (e)(ii) – confirming that the annual energy saving of an ICS as per cent of SSC threshold remains below 1%. Finally, by meeting the 1%, it is clear that an ICS will not exceed 5% of the same SSC threshold, and shall be considered additional.

[28] As per Paragraph 2(c) of Annex 27 of the 68th meeting of the CDM Executive Board, GUIDELINES ON THE DEMONSTRATION OF ADDITIONALITY OF SMALL-SCALE PROJECT ACTIVITIES (version 9), projects are considered additional if "project activities are solely comprised of isolated units where the users of the technology/measure are households or communities or Small and Medium Enterprises (SMEs) and where the size of each unit is no larger than 5% of the small-scale thresholds. Annex 21 of EB 61 established 60GWh per year as the SSC threshold. The conversion from 60 GWHe to 180 GWHth per year was approved in a clarification by the small-scale working group (SSC_233). Footnote 1 of Annex 27 of EB 68 clarifies that the size of each unit (ICS) has to be below 3000 MWh of energy saving per year which using the same logic of SSC_233 would translate to 9000 MWhth. Thus, if the ICS distributed under a CPA does not exceed 1 % of the SSC threshold (equivalent to 1800 MWhth,per year) and the CPA complies with eligibility criterion 3 (ie. qualify as a SSC CPA), the CPA is considered additional.

[29] Part II Section A of the SSC-PoA-DD and CME manual further describes the methods and mechanisms mentioned in this eligibility criterion.

SECTION C. 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 SSC-PoA has been given in Part II Section A.1 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 SSC-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 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:

SSC-PoA 1: Distribution of fuel-efficient improved cook stoves in Nigeria
SSC-PoA 2: Distribution of ONIL-stoves Mexico
SSC-PoA 3: Distribution of ONIL-stoves Guatemala
SSC-PoA 4: Distribution of improved cook stoves in Zambia
SSC-PoA 5: Distribution of Improved Cook Stoves in Sub-Saharan Africa

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 cookstoves 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 SSC-PoAs for ICS.

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

Key training needs:

Baseline survey: 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 has 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 still 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 chapter Part II Section B.7.2 of the SSC-PoA-DD and meet EB 74 Annex 6 confidence/precision requirements.

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 on Part II Section A.1 of the SSC-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 SSC-PoA:

- CME will review each CPA document and methodically go through each and every eligibility/applicability criterion of the SSC-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. If stove models have been used elsewhere, the CME will attempt to get actual performance data in the field to ensure minimum criteria for the SSC-PoA are met, such as the 20% minimum thermal efficiency, and it will review any WBT results to ensure they are in line with established protocols and have been conducted and certified by a national standards body or an appropriate certifying agent recognized by it. Alternatively manufacturer's specifications may be used.
- CME will review database/registration procedures to ensure proper recording of the ICS data collection in line with the methodology and SSC-PoA eligibility criteria.
- CME will review all CPA Implementer's monitoring procedures to ensure they conform with the Monitoring Plan in the SSC-PoA (as per Part II Section B.7.2 of the SSC-PoA-DD), including stove efficiency 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 A.1, each CPA Implementer installing fixed ICSs, 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 implementation of the CPA, and as necessary, the CME personnel or via appointed representative will visit each CPA region to ensure all procedures outlined in the SSC-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 SSC-PoA)

Each ICS in each SSC-CPA included in this SSC-PoA will be identified by a unique combination of customer name and geographical location, as well as a unique serial number. Quality control and quality assurance procedures will minimize any possible double counting. 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 the CME 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, the manufacturer will not generate the same serial number twice for ICS production 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 SSC-PoA and with CPAs in any other SSC-PoA or in a 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 SSC-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 confirm to be a household and acknowledge that they previously used a three-stone fire or traditional pot support and did not previously owned any ICS in order to be included in the CPA. Registration data collected will be verified by spot-checks. This will ensure that no customers will be included in a new CPA if they already own an ICS.

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

(i) There will be a record keeping system for each CPA under the SSC-PoA,

As explained in section "Means of collecting end-users' information" in Part II Section A.1 below, detailed information will be collected for 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 is 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, distributes/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 A.1. Each CPA will have its own database with a cumulative maximum number of ICSs below the small-scale limit.

The completed Registration Card (paper or soft copy, if via SMS or ICT) will also constitute an agreement that the household formerly used a wood predominantly on a three stone fire or 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 after CPA implementation. 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 SSC-PoA is not a de-bundled component of another CDM programme activity (CPA) or CDM project activity.

Paragraph 10 of EB54, Annex 13 'Guidelines on assessment of de bundling for SSC project activities' states that:

'If each of the independent subsystems/measures (e.g., biogas digester, solar home system) included in the CPA of a SSC-PoA is no larger than 1% of the small-scale thresholds defined by the methodology applied then that CPA of SSC-PoA is exempted from performing de-bundling check i.e., considering as not being a de-bundled component of a large scale activity.'

The AMS II.G threshold is a maximum energy saving of 180 GWH_{th}/ year for SSC projects. The de-bundling rule does not apply to this SSC-PoA as the ICS (the independent subsystem) being installed/distributed do not exceed 1% (as per guidance EB54 Annex 13) of the SSC threshold.

Each ICS in a typical CPA is in the order of magnitude of 0.005% of the SSC threshold.

This is calculated using the following formula illustrated using the small-scale energy savings threshold of $180GWh_{th}$/year:

Annual Energy Saving of an ICS as per cent of SSC threshold = $((NCV_{biomass}*B_{y,savings})/180GWh_{th})*100$

$= NCV_{biomass}*(B_{old}*(1-(\eta_{old}/\eta_{new}))/180GWh_{th})*100$

Where:

$NCV_{biomass}$	Net calorific value of the non-renewable biomass that is substituted (IPCC default for wood fuel, 0.015 TJ/tonne), calculated as ((0.015TJ/tonne)*(0.277777GWh/TJ)
$B_{y,savings}$	Total biomass that is saved in tonnes in one year (*y*)
B_{old}	Baseline biomass fuel consumption per appliance (i.e. in the absence of the project activity)
η_{new}	Efficiency of the ICS – 100% (using the highest possible thermal efficiency results in highest possible annual energy saving for an ICS (what can be considered as conservative if referring to the de-bundling criteria)).
η_{old}	Efficiency of the baseline stove – 0.10

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

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

SECTION D. Duration of PoA

D.1. Start date of PoA

>>

30/04/2012[30]

D.2. Length of the PoA

>>

28 years

SECTION E. Environmental impacts

E.1. Level at which environmental analysis is undertaken

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Environmental Analysis is done at PoA level. CPA boundaries are defined primarily by ICS location. The ICS models distributed through each SSC-CPA present similar positive environmental impacts wherever they are applied and no anticipated negative impacts. Therefore, a PoA-level Environmental Analysis is deemed most appropriate.

E.2. Analysis of the environmental impacts

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No negative environmental impacts have been identified from the proposed SSC-PoA.

The ICS disseminated in this programme are expected to present a substantially lower risk to the local and global environment compared to three-stone fires and traditional pot support, and also result in real socio-economic and health benefits to users.

[30] Which is the date at which the PoA documents were first uploaded to UNFCCC website for the stakeholder consultation process (GSP)

In particular, the activities will result in the following positive environmental impacts:

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

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

In accordance with Malawian regulations[31], an Environmental Impact Assessment is not required for typical CPAs included in the proposed SSC-PoA.

SECTION F. Local stakeholder comments

F.1. Solicitation of comments from local stakeholders

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

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 as follows:

A public local stakeholder consultation was held on 24th May 2012 at the premises of the Capital Sunbird Hotel, Lilongwe Malawi. Stakeholders were invited via multiple methods including: Two adverts in The Nation national newspaper published 8 and 15th May 2012; e-mail invitations were sent on 4 May 2012 with the Agenda to about 100 individuals from NGOs, project developers, private and public sector entities involved with cookstoves and/or energy-efficiency. Separate e-mails by individuals were sent to Government Departments/Ministries, donor agencies and embassies. Hand-delivered letters of invitation were sent to officials of Government Departments/Ministries; an advert has gone out to Zodiac Radio for announcing the meeting of 2 different days; poster adverts on A4 paper have been sent for posting in the towns of Lilongwe, Zomba, Rumphi, and Kasungu. The Chief Environmental Officer from the Environmental Affairs Department of Malawi participated on the meeting as Guest of Honor.

Moreover TLC, a Project Participant and CPA Implementer for the first CPA of this SSC-PoA conducts regular stakeholder meeting with farmers using traditional stoves in Malawi. TLC's team member in the field are constantly getting feedback from farmers on the current cooking situation and as the SSC-PoA is implemented, will also seek for feedback on ICS usage.

[31] This statement is confirmed by the Letter of No Objection issued on 21st June 2012 by the Acting Director of Environmental Affairs Department & CDM DNA for Malawi, where it is stated "Due to the nature and scope of the project, the proposed does not require an Environmental Impact Assessment to be undertaken prior to implementation".

F.2. Summary of comments received

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Stakeholders were given an evaluation form with 4 questions and field for answers. These questions were:
1) What is your impression of this meeting;
2) What do you like about this project;
3) What do you not like about this project;
4) Other comments / how can we improve?

In summary only positive feedbacks were received, with two main issues being raised: 1) additional clarity on types of stoves which can be implemented, and 2) more clarity on how the ICS in use are going to be monitored. The evaluation forms filled by each participant were provided to the DOE.

F.3. Report on consideration of comments received

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All clarification requested by local attending stakeholders were addressed during the debate and following the completion of the evaluation forms. Following the meeting PP circulated a copy of the presentation and transcripts were made available upon request. Comments received from stakeholders required no changes to the documents. Clarity on types of stoves which can be implemented under the SSC-PoA was given to stakeholders by PP, who clarified that there is no restriction on ICS models, as long as it follows the characteristics described in the PoA-DD. Minimum 20% thermal efficiency is required by the CME, who will also review the stove model and its acceptability by users. With regards to monitoring, PP clarified that a monitoring protocol will be in place following the CDM rules and that project implementers will, under the CME supervision, monitor the use of the stove, its efficiency and other additional parameters required by the CDM.

SECTION G. Approval and authorization

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Letters of Approval were issued by each of the Parties acknowledging the contributions of the POA to sustainable development. The letters authorize the implementation of PoA by the CME and have been made available to the validating DOE.

PART II. Generic component project activity (CPA)

SECTION A. General description of a generic CPA

A.1. Purpose and general description of generic CPAs

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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 Malawi. 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 is through CPA implementers' direct sales/field team - where CPA implementers will use their existing networks to market the ICS directly to end users in villages, communities, at

local market days and other large community events.
- The second channel will utilize existing local, experienced commercial distributors. Each of the distributors will have their own established network of retailers.
- The third channel will be through leveraging community organizations including NGOs, religious organizations and farmer associations.

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 distribution/installation methodology
This SSC-PoA allows for the distribution/installation of a variety models/types of ICS. ICSs can vary from simple brick stoves to modern stoves with insulated combustion chambers[32]. Below is an example of how project implementers may distribute/install ICSs according to two different ICS portability categories:

- Portable ICS:
  - No training of technicians/instructors/field trainers will be required for ICS that are imported as finished units;
  - CPA implementers shall describe in detail at the SSC-CPA-DD how stoves will be distributed;
  - If portable ICS 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 on the SSC-CPA-DD its capabilities 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 (when appropriate); and
  - 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

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

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[33]. 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 distribution/installation
- ICS serial number
- Retailer/distributer information[34]

Means of collecting end-users' information

CPA implementers shall ensure that the information contained in the Registration Card is collected and transferred to the CME. Collection of end-users' and stove-related information will be achieved through different means. Below are a couple of options (as appropriate and available):

- Direct contact: CPA implementer instructs their field team, distributors/retailers/partner organizations to fill the Registration Card with users' information when distributing/installing the ICS. This is initially envisaged to be done manually with ink over a printed Registration Card, but 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 handhold device that transfers data over the internet.
- Indirect: the users' data (same information as per Registration Card) may be 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 instructions on how to submit the SMS to the CPA implementer or CME.

Users' participation on the SSC-PoA, transfer of Carbon Rights to the CME and use of baseline stove

During the distribution/installation of the ICS, the user shall confirm that he/she is a household, the ICS is replacing a traditional 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, that his/her participation in the project is voluntary and to transfer the rights of any emission reduction generated by the ICS to the 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 sales/field or retailer team shall tick a box next this clause once end-user acknowledges it.

When SMS is used, this clause (and confirmation that the ICS will be used in a household) can be written on the instruction for the user on how to submit the information to the CPA implementer. By sending the

[33] 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 (eg. a name plate fixed on the kitchen's wall, or just an identification card kept by the household), instead of to the stove. For instances where the serial number plate can be attached to the ICS itself, it will be.

[34] This may include stoves technicians, field team, or other CPA Implementers' teams which will ultimately be delivering/installing the ICS to users.

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 verify 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 SSC-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 verify 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 within Malawi, 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.

Each CPA will define a limit to the number of stoves based on the specific ICS models and context, such that each is under the SSC energy savings threshold of 180 GWh_{th}/year.

The maximum number of 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

Maximum ICS per CPA = 180 GWH/($NCV_{biomass}$*$B_{y,savings}$)

Where:

$NCV_{biomass}$ Net calorific value of the non-renewable biomass that is substituted (IPCC default for wood fuel, 0.015 TJ/tonne) – which can be calculated as ((0.015TJ/tonne)*(0.277777GWh/TJ[35])

$B_{y,savings}$ Total biomass that is saved in tonnes in one year (*y*) – calculated as per paragraph 12 of methodology AMS.II.G (version 05):

$B_{y,savings} = B_{old} *(1-(0.10/ \eta_{new,y,i})$

[35] Conversion factor from TJ to GWh

Where:

B_{old}	Baseline woody biomass fuel consumption per appliance (i.e. in the absence of the project activity)
$\eta_{new,y,i}$	Efficiency of the ICS

SECTION B. Application of a baseline and monitoring methodology

B.1. Reference of the approved baseline and monitoring methodology(ies) selected

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The approved small-scale baseline and monitoring methodology used is AMS II.G, version 5, *Energy Efficiency Measures in Thermal Applications of Non-Renewable Biomass*

B.2. Application of methodology(ies)

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The SSC-PoA complies with the applicability criterions as per paragraphs 2, 3 and 29 of AMS.II.G. (version 5) as described below:

Applicability Criterion	***How a CPA Complies***
This category comprises efficiency improvements in thermal applications of non-renewable biomass. Examples of applicable technologies and measures include the introduction of high efficiency biomass fired cook stoves or ovens or dryers and/or improvements in existing biomass fired cook stoves or ovens or dryers. The efficiency of the project systems as certified by a national standards body or an appropriate certifying agent recognized by that body. Alternatively manufacturers' specifications may be used. Single pot or multi pot portable or in-situ cook stoves with specified efficiency of at least 20%.	CPAs will only allow the use of high efficiency biomass fired improved cook stoves (ICS). The thermal efficiency of the ICS will not be less than 20% as measured by water boiling tests. The thermal efficiency of the ICS will be certified by a national standards body or an appropriate certifying agent recognized by it. Alternatively, manufacturer's specifications may be used. CPA eligibility criterion 11 in this SSC-PoA-DD ensures that this applicability criterion is met for each CPA before inclusion and therefore for the SSC-PoA as a whole.
Project participants shall be able to show that 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	Non-renewable biomass has been used since 31 December 1989 in Malawi as demonstrated in Appendix 3 below.
The use of this methodology in a project activity under a programme of activities is legitimate if the following leakages are estimated and accounted for, as required on a sample basis using a 90/30 precision for the selection of samples: (a) Use of non-renewable woody biomass saved under the project activity to justify the baseline of other CDM project activities can also be a potential source of leakage. If this leakage assessment quantifies a portion of non-renewable woody biomass saved under the project activity that is then	This SSC-PoA, and hence all CPA under this SSC-PoA, opt to use option (c) of paragraph 23 of AMS.II.G. (v.05). I.e. B_{old} shall be multiplied by a net to gross adjustment factor of 0.95 to account for leakages and no surveys on leakage are required.

used as the baseline of other CDM project activities then Bold is adjusted to account for the quantified leakage; (b) Increase in the use of non-renewable woody biomass outside the project boundary to create non-renewable woody biomass baselines can also be a potential source of leakage. If this leakage assessment quantifies an increase in the use of non-renewable woody biomass outside the project boundary then Bold is adjusted to account for the quantified leakage; (c) As an alternative to subparagraphs (a) and (b), B_{old} can be multiplied by a net to gross adjustment factor of 0.95 to account for leakages, in which case surveys are not required.	

Sampling Plan

The sampling plan for the CPAs under this PoA was developed after the Standard for Sampling and Surveys for CDM Project Activities and Programme of Activities version 3.0 (EB 74 Annex 6) and the Guidelines for Sampling and Surveys for CDM Project Activities and Programme of Activities version 2.0 (EB 69 Annex 5). This sampling plan is outlined in Part II Section B.7.2 of this document.

B.3. Sources and GHGs

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	Source	Gas	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
	Combustion of non-renewable biomass for cooking (3-Stone fire or traditional pot support)	CH_4	No	Minor source of emissions and limited data available.
	Combustion of non-renewable biomass for cooking (3-Stone fire or traditional pot support)	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
	Combustion of non-renewable biomass for cooking (ICS)	CH_4	No	Minor source of emissions and limited data available.
	Combustion of non-renewable biomass for cooking (ICS)	N_2O	No	Minor source of emissions and limited data available.

B.4. 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 use of fossil fuels for meeting similar thermal energy needs. In this particular project, the baseline is the avoidance of non-renewable biomass, which actually has a higher emissions factor than many fossil fuels. As a result, using the default EF of 81.6 tCO_2/TJ is conservative.

B.5. Demonstration of eligibility for a generic CPA

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Each CPA must meet the following eligibility criteria before inclusion in to the PoA (examples of evidence are also provided in the table below):

Eligibility Criteria	Example of evidence to demonstrate compliance with eligibility criteria
1. Promote and install / distribute ICS in/to residential households in rural areas that use wood fuel following the SSC-PoA specifications[36]	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. Be implemented within the geographical boundary of the Republic of Malawi	Self declaration by CPA Implementer indicating the geographical boundary of the CPA. The possible geographic boundaries should be within the limits outlined in Part I Section A.5 of this document.
3. Have a maximum energy saving of 180 GWH_{th}/year throughout the CPA's crediting period to conform with the SSC threshold for type II projects as per EB 61 Annex 21 paragraph 3[37]	Calculations of energy savings per unit and maximum number of stoves that can be added to the CPA. Specification that all stoves included in the CPA will be shown in the CPA database and that ICSs that take the CPA over the 180GWHth/yr energy savings threshold will be excluded from the ER calculations.
4. Have a database that will uniquely identify and define households in which ICS have been installed or distributed[38]. In addition, each stove itself will be uniquely identified with a serial number	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.
5. Comply with the applicability conditions set out in the methodology AMS II.G version 5 "Energy efficiency measures in thermal applications of non-renewable biomass" and further described in Section B.2 of this SSC-PoA-DD	Thermal efficiency tests of stove to be installed/distributed; 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; Statement on the adoption of a default gross adjustment factor of 0.95 for leakage.

[36] The CME will not certify or test any specific organization, but it reserves the right, at its sole discretion, to chose CPA implementers based on its track-record and ability to successfully distribute/installed 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.

[37] At time of inclusion, the CME shall provide the DOE with the calculation as per Part II Section A of the SSC-PoA-DD demonstrating what the maximum number of ICSs is for that CPA so it remains below the small-scale threshold.

[38] Part II Section A of the SSC-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.

6. 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+[39]) 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) [40]	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. Not be registered as individual CDM project activities nor included in another registered SSC-SSC-PoA, as well as in any other voluntary carbon 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. Be approved by the CME prior to its incorporation into the SSC-PoA	Declaration from CME that CPA received approval for incorporation into PoA.
9. Be able to provide documentary evidence of the start date[41]	Self-declaration from CME or CPA Implementer stating the starting date of the CPA according to the relevant CDM guidance
10. 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)[42]	Self-declaration from CME or CPA Implementer
11. 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 5 approved by the CDM Executive Board). Alternatively manufacturers' specifications may be used	1. Water Boiling Test results showing thermal efficiency of above 20%. Test shall be certified by a national standards body or an appropriate certifying agency recognized by it (using the WBT outlined in AMS IIG, Version 5 approved by the CDM Executive Board). Alternatively manufacturers' specifications may be used. In the absence of all the above, a credible and experienced third party can conduct the tests and provide the report

[39] VER+ is TÜV SÜD's standard for voluntary emission reductions.

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

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

[42] 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.

12. Use baseline fuel consumption (B_{old}) data from the household fuel survey (as per baseline report uploaded together with the SSC-PoA-DD and further described in Section E.6.3 of the SSC-PoA-DD)	2. Statement of which baseline included in the CPA will be used in this CPA.
13. Use the national average non-renewable biomass (NRB) fraction as outlined in EB 67 Annex 22	Specification of the source of fNRB value. The source is included in this PoA.
14. Ensure that the CPA meets the criterion for not being a de-bundled component of a larger project activity and is additional - the debundling rule does not apply if the ICS as an independent subsystem, does not exceed 1% of the SSC threshold[43] (as per guidance EB54 Annex 13 and clarification SSC_233) and a CPA is additional if the ICS does not exceed 5% of the SSC threshold (as per guidance of EB68 Annex 27)[44]	Calculations demonstrating that each of the improved cook stoves included in the CPA is not greater than 1% of the small-scale threshold of 1.8 GWh thermal energy savings per year.
15. 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[45]	Indication of how the mechanism that transfers the ownership rights of CERs will be implemented.
16. Adhere to all requirements related to sampling for a SSC-PoA in accordance with section E.7.2 of the SSC-PoA-DD	Indication that CPA follows the sampling requirements outlined in Part II Section B.7.2 of this document.
17. Involve the promotion and distribution / installation of ICS through direct distribution/installation, delivery, community distribution events, or through commercial/retail outlets	Description of ICS promotion and distribution methods under the CPA.

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

B.6.1. Explanation of methodological choices

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[43] At time of CPA inclusion the CME shall provide the DOE with the calculations as per Part I Section C (e) (ii) – confirming that the annual energy saving of an ICS as per cent of SSC threshold remains below 1%. Finally, by meeting the 1%, it is clear that an ICS will not exceed 5% of the same SSC threshold, and shall be considered additional.

[44] As per Paragraph 2(c) of Annex 27 of the 68th meeting of the CDM Executive Board, GUIDELINES ON THE DEMONSTRATION OF ADDITIONALITY OF SMALL-SCALE PROJECT ACTIVITIES (version 9), projects are considered additional if "project activities are solely comprised of isolated units where the users of the technology/measure are households or communities or Small and Medium Enterprises (SMEs) and where the size of each unit is no larger than 5% of the small-scale thresholds. Annex 21 of EB 61 established 60GWh per year as the SSC threshold. The conversion from 60 GWHe to 180 GWHth per year was approved in a clarification by the small-scale working group (SSC_233). Footnote 1 of Annex 27 of EB 68 clarifies that the size of each unit (ICS) has to be below 3000 MWh of energy saving per year which using the same logic of SSC_233 would translate to 9000 MWhth. Thus, if the ICS distributed under a CPA does not exceed 1 % of the SSC threshold (equivalent to 1800 MWhth,per year) and the CPA complies with eligibility criterion 3 (ie. qualify as a SSC CPA), the CPA is considered additional.

[45] Part II Section A of the SSC-PoA-DD and CME manual further describes the methods and mechanisms mentioned in this eligibility criterion.

A CPA will have to use the following methodological choices:

- Determination of fNRB. A CPA will use the option of using the default value outlined in EB 67 Annex 22, which for Malawi, is 0.81;
- Option for determining $\mathbf{B_{y,\ savings}}$: According to the AMS II.G (version 5) methodology, $B_{y,savings}$ may be calculated in a number of ways (as per Options 1, 2 and 3 in Paragraph 12) and Option 2 will be adopted in CPAs under this POA. Option 1 is excluded because of the need to perform a Kitchen Performance Test, which will not be used in this SSC-PoA. Option 3 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 $B_{y,savings}$
- Because of the nature of traditional baseline stoves in Malawi – including three stone fires and traditional pot supports – it is not possible to ensure that these are disposed of. Therefore, this SSC-PoA will monitor the continued use of baseline stoves amongst users of ICS that are in operation in order to ensure that fuel-wood consumption of those stoves is excluded from B_{old} (option (b) Paragraph 23 AMS II.G Version 5.0).
- In the absence of the project activity, for the purposes of emissions reductions, the baseline is assumed to be the use of fossil fuels to meet similar thermal needs. In this case, as per AMS II.G Version 05, the default emissions factor of 81.6tCO_2/TJ is applied. In addition, Version 5 allows a default leakage adjustment factor of 0.95 to be applied to B_{old} to account for leakages. A typical CPA will also use this default.

B.6.2. Data and parameters that are to be reported ex-ante

(Copy this table for each data and parameter.)

Data / Parameter	***Bold***
Unit	Tonnes per annum
Description	Quantity of woody biomass used in absence of the project activity in three-stone fires or traditional pot supports per household
Source of data	Baseline survey
Value(s) applied	3.2558
Choice of data or Measurement methods and procedures	The baseline survey assessed the average wood biomass usage per household per annum amongst users of traditional 3-stone fires or traditional pot supports, according to interviews in Malawi . This data was gathered according to: Standard for Sampling And Surveys for CDM Project Activities and Programme of Activities (Version 04); EB 74 Annex 6.
Purpose of data	Calculation of baseline emissions
Additional comment	For the purposes of calculating ex-ante emission reductions a baseline adjustment factor has been applied to B_{old} to account for fuel-wood used in a second baseline stove for the 19.7% of households in the baseline study who reported using a second stove at least once per week. This baseline adjustment factor is based on the mean number of stoves used per household averaged across the entire baseline sample, calculated to be 1.0471 stoves. The value of B_{old} applied in this SSC-PoA-DD for wood fuel baseline stoves (3.2558 tonnes/year) incorporates this baseline adjustment factor. See baseline survey report uploaded together with this SSC-PoA-DD

Data / Parameter	η_{old}
Unit	Fraction
Description	Efficiency of 3-stone fire or traditional pot support cooking method (system being replaced)
Source of data	Methodology default
Value(s) applied	0.10
Choice of data or Measurement methods and procedures	AMS II.G version 5, paragraph 12, option 2
Purpose of data	Calculation of baseline emissions
Additional comment	

Data / Parameter	$f_{NRB,y}$
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	FAO, 2010
Value(s) applied	0.81
Choice of data or Measurement methods and procedures	EB 67 Annex 22
Purpose of data	Calculation of baseline emissions
Additional comment	

Data / Parameter	$NCV_{biomass}$
Unit	TJ/tonne
Description	Net calorific value of the non-renewable woody biomass that is substituted
Source of data	IPCC default
Value(s) applied	0.015
Choice of data or Measurement methods and procedures	AMS II.G, version 5, paragraph 11
Purpose of data	Calculation of baseline emissions
Additional comment	

Data / Parameter	$EF_{projected\_fossilfuel}$
Unit	tCO_2/TJ
Description	Emission factor: substitution of non-renewable biomass by similar consumers
Source of data	IPCC default
Value(s) applied	81.6
Choice of data or Measurement methods and procedures	AMS II.G, version 5, paragraph 11
Purpose of data	Calculation of baseline emissions
Additional comment	

Data / Parameter	L
Unit	Leakage
Description	Leakage adjustment Factor
Source of data	Default
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 29 (c) of the AMS II.G, version 5 methodology.
Purpose of data	Calculation of baseline emissions
Additional comment	

B.6.3. Ex-ante calculations of emission reductions

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$$ER_y = B_{y,savings} \cdot f_{NRBy} \cdot NCV_{biomass} \cdot EF_{projected\_fossilfuel} \cdot N_{y,i} \cdot L$$

Where:

ER_y	Emission reductions during the year y in tCO_2e
$B_{y,savings}$	Total biomass that is saved in tonnes during the monitoring year (*y*) per device
$f_{NRB,y}$	Fraction of biomass saved by the project activity in year y that has been established as non renewable biomass
$NCV_{biomass}$	Net calorific value of the non-renewable biomass that is substituted (IPCC default for wood fuel, 0.015 TJ/tonne, wet basis)
$EF_{projected\_fossilfuel}$	Emission factor for the substitution of non-renewable biomass by similar consumers. (IPCC default of 81.6 tCO_2/TJ)
$N_{y,i}$	Number of project devices of type i operating in year y
L	A net to gross adjustment factor (0.95 default).is applied above (equation (1) of AMS II.G, version 5) in order to adjust B_{old} to account for leakages as per paragraph 13 (a) of the methodology.

Calculating $B_{y, savings}$

According to the AMS II.G (version 5) methodology, $B_{y,savings}$ may be calculated in a number of ways (as per Options 1, 2 and 3 in Paragraph 12) and this SSC-PoA will allow the use of Option 2 in CPAs under this SSC-PoA.

Option 2:

$$B_{y,savings} = B_{old} \quad x \left(1 - \frac{\eta_{old}}{\eta_{new,y}}\right)$$

Where:

B_{old}	Baseline Quantity of woody biomass used in the absence of the project activity in tonnes
η_{old}	Efficiency of the baseline system/s being replaced. The 0.10 default value is used as the replaced systems are three-stone fires or conventional systems lacking improved combustion air supply mechanism and flue gas ventilation system i.e., traditional stoves.
$\eta_{new,y}$	Efficiency of the device being deployed as part of the project activity (fraction), as determined annually using the Water Boiling Test (WBT) protocol carried out in accordance with national standards (if available) or international standards or guidelines. Weighted average values will be used if more than one type of system is being introduced by the project activity.

In order to account for stoves which have been in operation for fractions of the monitoring period, the following formula is used:

$$Ny,i = \sum_{j=1}^{J_y} n_{y,\,j} \times t_{y,\,j}$$

Where:

$N_{y,i}$	Total number of stoves in operation for a full monitoring period equivalent within each SSC-CPA
$n_{y,j}$	Number of ICS operating in monitoring period *y* for j days,
j	days since installation or distribution of the ICS or the start date of monitoring period for ICS installed/distributed in prior monitoring periods (whichever is later), until end of monitoring period
$t_{y,j}$	Fraction of monitoring period *y* that the stove is in operation ($t_{y,j} = j/J_y$). Note, for ICS installed in prior monitoring periods $t_{y,\,j} = 1$.
J_y	Total number of days in the monitoring period *y*

For the purposes of calculating ex-ante emission reductions a baseline adjustment factor has been applied to B_{old} to account for wood fuel used for the 19.7% of households in the baseline study who reported using a second stove at least once per week. This baseline adjustment factor is based on the mean number of stoves used per household averaged across the entire baseline sample, calculated to be 1.0471[46].stoves/household. The value of B_{old} applied in this SSC-PoA-DD for wood fuel baseline stoves (8.92 kg/day) incorporates this baseline adjustment factor.

[46] This factor was calculated as follows:

The percentage of households continuing to use a baseline stove in addition to an ICS will be monitored in order to address paragraph 26 (b) of the AMS II.G (version 5) methodology. The monitored (ex-post) percentage of ICS users continuing to use a baseline stove in addition to the ICS (parameter SS_y) will be compared to the ex-ante percentage found in the baseline (19.7%) and B_{old} will be adjusted proportionally based on the proportional change in the percentage. The parameter used to calculate ex-post $B_{y,savings}$ will be $B_{old,\ adjusted}$ in order to account ex-post for fuel-wood used in baseline stoves in addition to ICS. This procedure is outlined here:

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

Where:

$N_{y,i}$ Total number of stoves (i)[47] in operation for a full monitoring period equivalent within each SSC-CPA

η_{old} Efficiency of the baseline system/s being replaced. The 0.10 default value is used as the replaced systems are three-stone fires or conventional systems lacking improved combustion air supply mechanism and flue gas ventilation system i.e., traditional stoves.

$\eta_{new,y,i}$ Efficiency of the system of vintage (i) in year y being deployed as part of the project activity (fraction), as determined using the Water Boiling Test (WBT) protocol.

and

$$B_{old,adjusted} = B_{old} \times \left[\frac{1.0471}{1+(SS_y/0.197)\times(1.0471-1)}\right]$$

Where:

B_{old} Baseline Quantity of woody biomass used in the absence of the project activity in tonnes

SS_y is the percentage of households that continue to use baseline stoves simultaneously with ICS at least once per week (see section B.7.1. of the SSC-PoA-DD);

Note in the formula above that wood-fuel baseline data is used when calculating $B_{old,adjusted}$. The value 0.197 is the percentage of households in the baseline study who use a second stove simultaneously at least once per week and 1.0471 is the multiple stove adjustment factor, calculated as follows:

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1. Each household's fuel consumption datum (only adjusted for seasons) was divided by its corresponding mean number of baseline stoves used. The results of all households in the dataset are averaged to obtain a baseline fuel consumption mean adjusted for seasons AND multiple stove use.

2. The fuel consumption mean only adjusted for seasons (average of all the samples in the database) is divided by the fuel consumption mean adjusted for seasons AND multiple stove use (this is also a average of all the samples in the database) to obtain the multiple stove use adjustment factor (in this case 1.0471)

Note that this is slightly different from taking the mean number of stoves used per household across the sample and applying it to the baseline fuel consumption mean adjusted for seasons.

[47] Vintage shall be defined as the "age" of the ICS – ie. Number of years it has been in operation. – ie. all stoves below 1 year (or 365 days) of use belong to vintage 1, all stoves between 1 and below 2 years of use to vintage 2 and so on. Note that i will match the efficiency of the stove at a certain "age"; e.g. stoves vintage 2 will be grouped together and WBTs will dictate their $\eta_{new,y,i.}$

$$Multi\ stove\ adjustment\ factor = \frac{B_{old\ adjusted\ for\ seasons\ and\ multiple\ stove\ use}}{B_{old\ adjusted\ for\ seasons}} = \frac{9.34}{8.92} = 1.0471$$

See section 6.7 of the baseline study uploaded together with SSC-PoA-DD for additional information.

As specified in the AMS II.G (version 5) methodology, B_{old} is determined by using one of the following two options:

(a) Calculated as the product of the number of devices multiplied by the estimated average annual consumption of woody biomass per device (tonnes/year). This may be derived from historical data or a survey of local usage,

or

(b) Calculated from the thermal energy generated in the project activity as:

$$B_{old} = \frac{HG_{p,y}}{NCV_{biomass} * \eta_{old}}$$

The project proponents select option (a) directly above to determine B_{old}.

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 (0.015 TJ/tonne)
2. $EF_{projected\_fossilfuel}$ The IPCC default value is selected (81.6 tCO_2/TJ)
3. $\eta_{old,}$ The methodology default value for 3-stone fires and traditional pot supports is selected (0.10 if Option 2 is used)
4. The 0.95 leakage adjustment factor is applied in line with AMS II.G version 5.

The following parameters have been assessed by independent experts, using appropriate assessment techniques (see the Baseline and national NRB reports uploaded together with this SSC-PoA-DD for more details):

1. $B_{old,}$ The average quantity of woody biomass used per stove in the absence of the project in three stove fires or traditional pot supports. This is derived from baseline survey conducted in Malawi by HED Consulting. Baseline household wood fuel usage has been surveyed across Malawi for a national estimate that was found to be homogenous (see baseline report uploaded together with this SSC-PoA-DD of this SSC-PoA-DD).
2. η_{new} The efficiency of the new appliance (ICS). The thermal efficiency of ICS used in each CPA will meet or exceed the 20% minimum thermal efficiency required by AMS II.G Version 5 as certified by a national standards body or an appropriate certifying agent recognized by it, or by manufacturer's specifications, before CPA inclusion. When monitoring $\eta_{new,y,i}$ due to the high number of WBTs needed, the WBTs will be coordinated by the CME and undertaken following WBT protocol 3.0 (or more recent version at the discretion of the CME) by a trained professional working for the CME or CPA Implementer or an experienced third party.

Note: Methodology AMS II.G (version 5), requires that monitoring ensures that (a) either the replaced low efficiency appliances are disposed of and not used within the boundary or within the region; or (b) if baseline stoves continue to be used, monitoring shall ensure that the fuel-wood consumption of those stoves is prorated in B_{old}. In this SSC-PoA option (b) is used B_{old} will be adjusted ex-post to account for

the wood used in any baselines stoves that continue to be in used in addition to the ICS. The baseline survey determined the percentage of households that are currently using more than one wood-burning stove and are likely to use more than one stove after the ICS is provided (see baseline report uploaded together with this SSC-PoA-DD). This survey provides an adjustment factor to account for the amount of wood used by that second stove, thus B_{old} is adjusted based on this factor.

B.7. Application of the monitoring methodology and description of the monitoring plan
B.7.1. Data and parameters to be monitored by each generic CPA
(Copy this table for each data and parameter)

Data / Parameter	$n_{y,j}$
Unit	Quantity
Description	Number of stoves still in operation during the monitoring period as determined by the monitoring survey. This includes total number of stoves distributed/installed in the entire CPA.
Source of data	ICS registration data and data from the Sampling Plan
Value(s) applied	For the purposes of calculating ex-ante emission reductions, assumption is 20,763 stoves based on the first CPA with a drop-out rate of zero. This is the maximum number of stoves the first CPA can host.
Measurement methods and procedures	The percentage of stoves found to be still in operation based on the sampling plan in each monitoring period will be applied to the total number of stoves distributed/installed in each CPA (according to the ICS registration records in the monitoring database and the applicable sample frame). 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. If, based on the sample size selected in any monitoring period, the confidence/precision requirements set out in EB 74 Annex 6are not satisfied, then CPA implementers will follow the procedures outlined in the Monitoring Plan (Part II Section B.7.2 of the SSC-PoA-DD) to ensure the required level of confidence/precision is met.
Monitoring frequency	Annually
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 reductions calculations. Internal cross-checks by the CME or CPA implementer will be undertaken as QC.
Purpose of data	Calculation of baseline and project emissions
Additional comments	See Part II Section B.7.2 of the SSC-PoA-DD for more detail on monitoring procedures

Data / Parameter	$t_{y,j}$
Unit	Fraction
Description	Fraction of monitoring period the stove is in operation (days in operation/total days in monitoring period)
Source of data	ICS registration data in monitoring database and length of monitoring period
Value(s) applied	For the purposes of calculating ex-ante emission reductions, assumption is 1.0 – ie. assumes no stove has droped-out (drop-out rate of 0)
Measurement methods and procedures	The fraction will be calculated by dividing the number of days from the registration date of the stove, or the start date of the monitoring period (whichever is later), until the end of the monitoring period by the total number of days in the monitoring period.
Monitoring frequency	Annually
QA/QC procedures	The unique reference number of each stove shall be logged in the monitoring database. The date of registration shall be utilized to determine the portion of the monitoring period that the stove has been in operation. Any interruption in the stoves' operation (e.g. where stoves are replaced or drop out) will register as missed operating time in the monitoring database for emissions calculation purposes.
Purpose of data	Calculation of baseline and project emissions
Additional comments	See Part II Section B.7.2 of the SSC-PoA-DD for more detail on monitoring procedures

Data / Parameter	$\eta_{new,y}$,
Unit	Fraction
Description	Continuing efficiency of ICS
Source of data	Efficiency tests in each monitoring period
Value(s) applied	CPA-specific
Measurement methods and procedures	The tests will be coordinated by the CME and undertaken following WBT protocol 3.0 (or more recent version at the discretion of the CME) by a trained professional working for the CME or CPA Implementer or an experienced third party.
Monitoring frequency	Annually
QA/QC procedures	The WBT Protocol 3.0 or a more recent version will be used at CME discretion
Purpose of data	Calculation of baseline and project emissions
Additional comments	See Part II Section B.7.2 of the SSC-PoA-DD for more detail on monitoring procedures

Data / Parameter	SS_y
Unit	Percentage
Description	The percentage of ongoing baseline stove use within the population of in-use ICS during a monitoring period.
Source of data	Monitoring of ongoing baseline stove use will be undertaken using the sampling approach outlined in section B.7.2 of the SSC-PoA-DD (to meet EB 74 Annex 6confidence/precision requirements).
Value(s) applied	The value applied for the purposes of calculating expected emission reductions is CPA specific according to the baseline biomass consumption applied. As a conservative approach to ex-ante calculations, the percentage of households in the baseline study using a second stove at least once per week (19.7%), resulting in a mean total household stove usage 1.0471. This ex-ante baseline adjustment factor has been applied to B_{old} in order to subtract fuel-wood used in these second stoves resulting in the B_{old} estimate of 3.2558 tonnes/year applied for the purpose of calculating expected emission reductions in Part II Section B.6.2 of the POA-DD.
Measurement methods and procedures	A survey will be conducted asking households if they use a second (baseline) stove at least once per week, as per the monitoring plan outlined in Part II Section B.7.2 of the SSC-PoA-DD. SS_y will be calculated in each monitoring period as follows: the number of sampled households with in-use ICS that also continue to use a baseline stove divided by the total number of in-use ICS in the sample.
Monitoring frequency	Annually
QA/QC procedures	Data for this parameter will be collected using the same survey for the parameter $n_{y,i}$ (in-use appliances) conducted 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 emissions
Additional comments	See Part II Section B.7.2 of the SSC-PoA-DD for more detail on monitoring procedures This parameter is used to address paragraph 26 (b) of the AMS II.G (Version 5) methodology.

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

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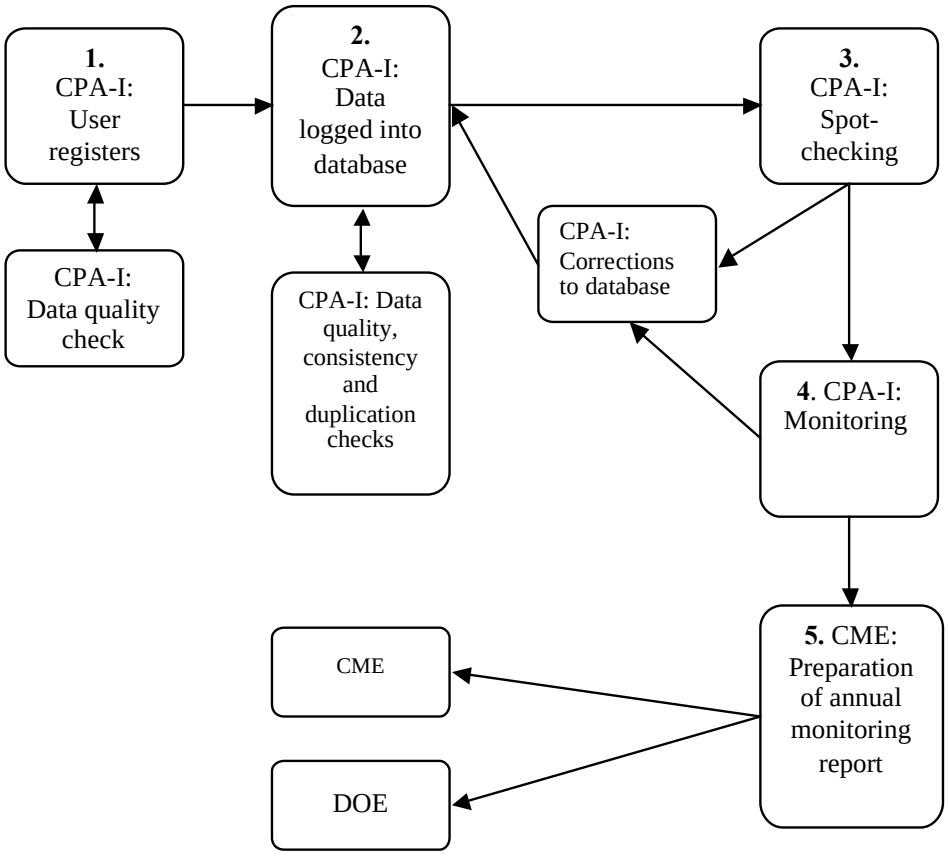
The Monitoring Plan applied in this SSC-PoA involves a number of key elements that ensure that the CME and CPA-Implementer have high-quality, unbiased and reliable information regarding the performance of the project in terms of implementation and outcomes, and for the purposes of calculating Certified Emission Reductions (CERs) following AMS II.G version 5 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* [48] 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 SSC-PoA, it is not economically feasible to monitor each individual ICS unit distributed. Therefore, representative sampling will be undertaken as part of a SSC-PoA-wide Sampling Plan (by grouping and sampling across CPAs) that is designed in line with the requirements of the Standard for Sampling and Surveys for CDM Project Activities and Programme of Activities version 4 (EB 74 Annex 6).

Samples will be drawn from ICS recorded in a database (or databases) administered by the CME or made available to the CME by CPA Implementers. These database records are referred to as CME records database or Database. A detailed explanation of this database is found in Part I Section C (Management system) of this PoA-DD.

(b) *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 20 of EB 74 Annex 6) for annual and 95/10 for biennial sampling across CPAs as per Methodology AMS-II.G version 05). In case a single CPA is sampled, 90/10 confidence/precision for annual and 95/10 confidence/precision shall be required for biennial sampling[49] (as per Methodology AMS-II.G version 05). As per the AMS-II.G version 5 paragraph 28, "in cases where survey results indicate that 90/10 precision or 95/10 precision are not achieved, the lower bound of the 90% or 95% confidence interval of the parameter value may be chosen as an alternative to repeating the survey efforts to achieve the 90/10 or 95/10 precision." However, the use of the use of the lower bound of the confidence interval shall only be used when a single CPA is sampled (versus sampling across CPAs). Alternatively, the CME may choose to apply the provision in paragraph 16 (b) (i) b of the Standard for Sampling and Surveys in CDM Project Activities and Programme of Activities Version 04.0. The provision allows for "discounting by no less than 3 times (x3) the percentage precision points missed (e.g. if the attained precision is 90/11 then the emission reduction estimates are discounted by 3 percent). The use of this provision shall also be used when a single CPA is sampled (versus sampling across CPAs). Monitored Parameters

[48] EB 74 Annex 6

[49] Single CPA sampling will only be applicable when a Primary Sampling Unit only consists of one CPA.

Monitored Parameters:

Parameter	Description of Parameter
$n_{y,j}$	Proportion of ICS still in operation
SS_y	Percentage of continued baseline stove use among ICS households in the database
$\eta_{new,y,i}$	Thermal Efficiency of operational ICS

(c) *Target Population*

- The target population for the proportion of ICS still in operation ($n_{y,j}$) are the stoves in the CME database records (still in operation or not) for which emissions reductions are to be accounted in the monitoring period in question.
- The target population for the percentage of continued baseline stove use among ICS households ($SS_{y,i}$) are units with operational ICS in the CME records database for which emissions reductions are to the accounted in the monitoring period in question.
- The target population for efficiency of new appliances ($\eta_{new,y,i}$) is the set of stoves still in operation in the CME records database for which emissions reductions are to the accounted in the monitoring period in question.

(d) *Sampling Frame*

Two sampling frames shall be defined:

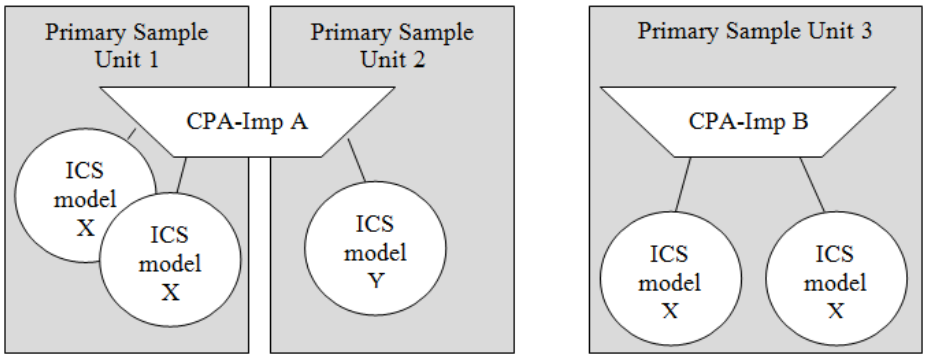
1) Sampling frame for proportion of ICS still in operation ($n_{y,j}$) and percentage of continued baseline stove use among ICS households in the database (SS_y)

The POA is open to different CPA Implementers and different models of ICS, of different vintages which introduces variability to the target population. To account for these differences, the first step is to identify homogeneous populations among the ICS population contained in the Database. In specific, homogeneous populations are CPAs which have:

1. The same CPA Implementer
2. The same ICS model
3. The same vintage

Ie. CPAs with the same CPA Implementer, same ICS model and same vintage can therefore be grouped together and form a Primary Sampling Unit. In the event the POA has CPAs with two different CPA Implementers using the same ICS model and vintage, these will form two distinct populations, or two different Primary Sampling Units. Same is true if the same CPA Implementer has two different ICS models being implemented in the same vintage – this will form two Primary Sampling Units. Finally, two primary sampling units will be formed by ICS from two different vintages and all other factors (ICS model and CPA Implementer) remaining equal.

The below schematics illustrate the example used above (assuming all stoves in the schematic are in one vintage). This is justified by the fact that CPA Implementer, stove model and vintage might vary in terms of performance and it is important for the CME to collect and monitor accurate data for each CPA Implementer distributing each ICS model in each vintage.



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

The thermal efficiency of operational ICSs shall vary in accordance with its model, but not within different CPA Implementers. Hence for parameter $\eta_{new,y,i}$ the Primary Sampling Unit shall be defined as the group of ICSs of the same model and same vintage. Ie. take the example of different CPA Implementers are implementing CPAs using an ICS model "Y" for the past 3 years. In order to evaluate the thermal efficiency of the different vintages of the same stove "Y", the primary group shall consist of all ICSs implemented in different CPAs under the SSC-PoA (regardless of CPA Implementer) which are of the same vintage and same model – in this example there are three primary sampling units which are: 1) ICSs of Model Y and vintage 1 (less than one year in operation); 2) ICSs of Model Y and vintage 2 (between one and two years of operation); and 3) ICSs of Model Y and vintage 3 (between two and three years old in operation).

(e) *Sampling Method*

A multi-stage sampling combines the cluster and simple random sampling approaches in a multi-stage approach, and can be thought of as sampling from a number of groups, and then going on to sample units within each group (paragraph 73 of EB 69 Annex 5). In a first stage, all CPAs that have been included in the monitoring period are grouped into Primary Sampling Units - following the 2 sampling frames described above (ie. Primary Sampling Units for $n_{y,j}$ and SS_y are CPAs with same CPA Implementer, vintage and ICS model; and Primary Sampling Units for $\eta_{new,y,i}$ are CPAs with the same ICS model and same vintage regardless of CPA Implementer). Each Primary Sampling Unit will be comprised of a number of districts[50]– the Secondary Sampling Units – and the number of households/ICS within each sampled district which will be visited/sampled. The number of districts to be sampled is selected using a simple random sampling approach from a list of all districts present in each Primary Sampling Unit. Once the districts are defined, ICS/households present in each district will be randomly selected.

To ensure a random selection of districts and 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 as calculated by the CME. This is also applicable to districts, as the database will contain all the districts where ICSs are located and therefore each district can be assigned a number at 1 and increasing up to the total number of districts in the Database for that pre-defined sampling frame.

[50] Population centres, villages, towns and other definitions for areas where households are located can be included/used as long as it is not considered as urban area as defined in footnote 7. Ie. the CME may opt to sample across population centres, villages, towns and other area definitions instead of districts per se, assuming there is enough and appropriate data to define a population centre, village, towns or other definitions for areas where households are located for that monitoring period.

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

$n_{y,j}$: 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)

SS_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)

$\eta_{new,y,i}$: ICS will be tested using WBTs (ICS thermal efficiency)

The efficiency of ICS ($\eta_{new,y,i}$) 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 and same vintage (Primary Sample Unit). Using the formulas in the section "Sample Size" below, the CME will randomly sample the required number of ICS from a certain number of districts. It is important to note that $\eta_{new,i}$ and hence the thermal efficiency test must take into consideration --and be conducted for-- each ICS vintage. As an illustrative example, consider a SSC-PoA that distributed a single ICS manufacturer/model but had two vintages: 75% of the total ICS distributed have been in use for less than 365 days (ie. vintage 1) and 25% have been in operation for over 365 days but less than 730 days (ie. vintage 2). For each vintage, a number of districts and ICSs within those districts are to be randomly selected and sampled and the appropriate number of districts and households are to be determined using the below equations. The mean thermal efficiency of each vintage shall be used for calculating emission reductions for all stoves of vintage *i*. Ie. if $\eta_{new,y,i}$ 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%. In the event the monitoring period is over one year (let's use the example of 2 years) and an ICS has began its operation on the first day of the monitoring period, the stove shall apply the equivalent number of days in operation under vintage 1 and the equivalent number of days of operation under vintage 2. For avoidance of doubt, in every monitoring period, all ICS vintages will be sampled and the thermal efficiency for each vintage shall be established and used for the calculation of emission reductions for that monitoring period.

(f) *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 confidence/precision for annual[51] and 95/10 confidence/precision for biennial sampling.[52] In case a single CPA is sampled, a 90/10 confidence/precision is required for annual sampling and 95/10 confidence/precision shall be required for biennial sampling.[53]

The procedure to determine the sample of households will ensure that they adequately represent the broader project population, minimizing sampling error. Using, a 95 per cent confidence level, and a 10 per cent margin of error, a random sample of districts will be selected from each Primary Sampling Unit. Households within the selected districts will then be randomly selected among the population in the selected districts. 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 ($n_{y,j}$), the fraction of baseline stoves in use within the population of operational ICS during a monitoring period (SS_y), and the average ICS efficiency, ($\eta_{new,y,i}$). The parameters $n_{y,j}$ and SS_y will be sampled through surveys with a random sample of households and districts using the above described confidence/precision levels depending on annual or biennial monitoring frequency.

[51] As per EB 74 Annex 6, paragraph 20, footnote 18
[52] As per Methodology AMS-II.G version 05paragraph 28
[53] As per Methodology AMS-II.G version 05 paragraph 28

An overview of the estimated sample sizes for a hypothetical population of 28 districts and 11,071[54] ICS per district applying a level of 95/10 is provided below. It is likely that all of the sample frames for each parameter will include fewer than 28 districts in the first monitoring period, so this is a conservative approach. Of the three parameters to be monitored, two are proportions/percentages (SS_y and $n_{y,j}$) and one is a mean value $\eta_{newy,,i}$.

The proposed multi-stage sampling approach requires the estimation of district sample sizes for each Primary Sampling Unit. The CME shall decide the number of ICS to sample within each district and calculate the district sample sizes accordingly to meet the required level of confidence/precision. All Primary Sampling Units (unique combinations of ICS models, vintage and CPA Implementer, or groups of same ICS model and vintage) will be sampled. Therefore, the selection of a sample of Primary Sampling Units will not be required. However, given the multitude of Secondary Sampling Units (districts) and ICS envisaged to make part of the proposed SSC-PoA, using a sampling approach for these sampling units is considered appropriate. The districts and then the ICS within districts to sample shall be randomly selected.

In order to calculate the required sample size estimates, values for the proportions, mean values, and variances or standard deviations are required. For the first monitoring period, values from a pilot study shall be applied. For the following monitoring periods, the estimates shall be adjusted taken the results of the previous monitoring period(s) into account.

To estimate the number of districts to be sampled for parameters $n_{y,j}$ and SS_y the following equation[55] is used:

$$c \geq \frac{\frac{SD_B^2}{\bar{p}^2} \times \frac{M}{M-1} + \frac{1}{\bar{u}} \times \frac{SD_W^2}{\bar{p}^2} \times \frac{\left(\bar{N}-\bar{u}\right)}{\left(\bar{N}-1\right)}}{\frac{precision^2}{z^2} + \frac{1}{M-1} \times \frac{SD_B^2}{\bar{p}^2}}$$

Where:

c	= number of districts that should be sampled
M	= total number of districts in the population
$\bar{u}$	= number of households/ICS to be sampled within each district
$\bar{N}$	= average number of households with ICS per district
SD_B^2	= Unit variance (variance between districts)
SD_W^2	= average of group variances (average within district variation)
p	= overall proportion
z	= Constant (z-score) referring to the level of confidence (e.g. 1.96 for 95% confidence).
Precision	= Required precision (e.g. 10% = 0.1)

[54] The CME envisage that over the next 7 years of operation, a total of 310,000 ICSs (contained in approximately 16 CPAs) would have been distributed in 28 districts of Malawi. This gives an average of 11,071 (310,000 ICS divided by 28 districts) ICSs per district. For this example, the CME will opt to apply the 11,071 ICS per district to 28 districts.

[55] Equation 16, *Guidelines for Sampling and Surveys for CDM Project Activities and Programme of Activities (EB69 Annex 5, Version 2)*

The following assumptions are made to exemplify the sample size calculation for proportion parameters: $n_{y,j}$ and *SSy*:

- The total number of districts in the Primary Sampling Unit is 28 (also applicable to $\eta_{new,y,i}$), which is the number of districts in Malawi used here for exemplify the calculations
- The number of households to be sampled within each district is 20[56]
- The average number of households with ICS per district is 11,071 (also applicable to $\eta_{new.y,i}$)

For the proportion of parameter $n_{y,j}$ the following assumptions are applied:

- The proportion of stoves in operation ($n_{y,j}$) is 0.88[57]
- The unit variance (SD_B^2)for the proportion of stoves in operation ($n_{y,j}$) is 0.02[58]
- The average of within district variances for the proportion of stoves in operation ($n_{y,j}$) is 0.088[59]

For the SS_y the following assumptions are applied:

- The proportion value for parameter SS_y is 0.197[60]
- The unit variance for parameter SS_y is 0.021[61]
- The average of within district variances for parameter SS_y is 0.118[62]

In cases where the sample size required for a districts is larger than the number of ICS available for monitoring in that location,[63] the sample will be complemented by selecting the next closest ICS to the districts until the proposed number of households with ICS is obtained. The determination of the closest ICS to the district will be estimated using GPS coordinates, and measured from a midpoint of the chosen district.[64]

The CPA Implementers or CME will collect pilot data to determine sample sizes for the first monitoring period. In subsequent monitoring periods, the sample size equations will be updated with the values obtained during monitoring from previous monitoring periods.

If the number of districts is determined to be insufficient based on actual monitoring data, additional districts will be randomly selected from the Database until the desired level of confidence/precision is attained for a specific Primary Sampling Unit.

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[56] The number of households per district to be sampled was arbitarely chosen for exemplification purposes only

[57] The value is based on pilot studies of similar projects where the CME of this SSC-PoA is project participant. The values available to the CME at the time of submission of this document varied between 0.86 and 0.90. The mid-value of this range (0.88 = (0.86+0.90)/2) is used for the purpose of exemplifying sample size calculations in this SSC-PoA.

[58] Pilot studies of similar projects (where the CME of this SSC-PoA is project participant) indicate that unit variances are in the range of 0.7% to 3.8% of the mean value of the proportion of stoves still in operation. Applying the mid-value of these data points (0.023=(0.007+0.038)/2) to the proportion of stoves still in operation of 0.88 yields a unit variance of 0.02.

[59] The average of district variances in similar projects (where the CME of this SSC-PoA is a project participant) is on average 10% of the mean value for the proportion of stoves in operation ($n_{y,j}$). Applying this 10% factor to the proportion of stoves still in operation in this example yields an average of within district variances of 8.8%.

[60] This is the value found in the baseline study

[61] Pilot studies of similar projects (where the CME of this SSC-PoA is project participant) indicate that unit variances are in the range of 9.6% and 11.3% of the mean SS_y value. Applying the mid-value of these data points (0.105 =(0.096+0.113)/2) to the SS_y value found in the baseline studies (0.197) yields a unit variance of 0.021.

[62] The average of district variances in similar projects is on average 60% of the mean value for parameter SS_y. Applying this 60% factor to the SS_y value in this example yields an average of within district variances of 11.8%.

[63] The ICS available for monitoring are the number of households with ICS in that district that are willing to respond to monitoring surveys and inspections.

[64] The midpoint of any given district shall be defined as the average GPS coordinates (longitude and latitude) of all ICS in that district contained in the CME Database.

In cases where for any reason (eg. physical access impaired by natural conditions such as flooding; or political instability leading to insecure conditions, etc) a district cannot be sampled; another district will be randomly selected from the database.

Sample size calculation:
The calculation of the required sample size for each parameter in the first monitoring period is illustrated below for a 95/10 level of confidence and precision (for biennial monitoring periods the sample sizes will be recalculated using 95/10 confidence/precision values). In all cases a conservative approach is taken, however if for any parameter the required 95/10 confidence/precision is 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 $\mathbf{n_{y,j}}$:

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

$$c \geq \frac{\frac{0.02}{0.88^2} \times \frac{28}{28-1} + \frac{1}{20} \times \frac{0.088}{0.88^2} \times \frac{(11{,}071-20)}{(11{,}071-1)}}{\frac{0.1^2}{1.96^2} + \frac{1}{28-1} \times \frac{0.02}{0.88^2}} = 9.1$$

Therefore, in this case a sample size of 10 districts where 20 ICSs are sampled in each district – totalling 200 ICSs to be sampled – is sufficient to achieve the required confidence/precision for the $\mathbf{n_{y,j}}$ value.

In case the resulting sample size to achieve the desired confidence/precision levels is smaller than 30 ICS, then the sample size shall increase to 30, in accordance with EB 74 Annex 6, paragraph 12 and footnote 15. The increase shall be made in the number of ICS sampled per district.
Parameter $\boldsymbol{SS_y}$**:**

The example below uses the value of $\mathbf{SS_y}$ found in the Baseline study uploaded together with this SSC-PoA which is 0.197[65,] However, in cases where the percentage of second stove use is less than 0.50, it will be appropriate to use the larger proportion ($1\text{-}SS_y$) to determine the sample size, in accordance to EB 74 Annex 6 paragraph 11(a). It is therefore appropriate to use the larger proportion (1 – 0.197 = 0.803) to determine the sample size.

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

[65] 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.

$$c \geq \frac{\frac{0.021}{0.803^2} \times \frac{28}{28-1} + \frac{1}{20} \times \frac{0.118}{0.803^2} \times \frac{(11{,}071-20)}{(11{,}071-1)}}{\frac{0.1^2}{1.96^2} + \frac{1}{28-1} \times \frac{0.021}{0.803^2}} = 11.2$$

The resulting sample size in this case is 12 districts where 20 stoves are sampled in each district

As in the case of parameter $n_{y,i}$, if the resulting sample size based on the above equation is smaller than 30 ICS, then the sample size shall increase to 30 in accordance with EB 74 Annex 6 , paragraph 12. The increase shall be applied to the number of ICS sampled per district.

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

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 number of districts to be sampled for parameter $\eta_{new,y,i}$ the following equation[66] is used:

$$c \geq \frac{\left(\frac{SD_B}{Clustermean}\right)^2 \times \frac{M}{M-1} + \frac{1}{\bar{u}} \times \left(\frac{SD_W}{Clustermean}\right)^2 \times \frac{(\bar{N}-\bar{u})}{(\bar{N}-1)}}{\left(\frac{precision}{z}\right)^2 + \frac{1}{M-1} \times \left(\frac{SD_B}{Clustermean}\right)^2}$$

Where:

c	= number of districts that should be sampled
M	= total number of districts in the population
$\bar{u}$	= number of households/ICS to be sampled within each district
$\bar{N}$	= average number of households with ICS per district
SD_B^2	= Unit variance (variance between districts)
SD_W^2	= average of group variances (average within district variation)
Clustermean	= average efficiency of ICS across districts
Overallmean	= average efficiency of all ICS sampled
z	= Constant (z-score) referring to the level of confidence (e.g. 1.96 for 95% confidence).
Precision	= Required precision (e.g. 10% = 0.1)

Given that the same number of stoves will be tested in each district, the weight of each ICS to the Clustermean and to the Overallemean is the same. Hence the Clustermean is equal to the Overallmean – ie. the average of efficiency of ICSs across districts is the same as the average efficiency of all ICSs monitored. The above equation shall, therefore, be simplified as:

[66] *Guidelines for Sampling and Surveys in CDM Project Activities and Programme of Activities* (EB 69, Annex 5 paragraphs Equation 33)

$$c \geq \frac{\left(\frac{SD_B}{mean}\right)^2 \times \frac{M}{M-1} + \frac{1}{\bar{u}} \times \left(\frac{SD_W}{mean}\right)^2 \times \frac{\left(\bar{N}-\bar{u}\right)}{\left(\bar{N}-1\right)}}{\left(\frac{precision}{z}\right)^2 + \frac{1}{M-1} \times \left(\frac{SD_B}{mean}\right)^2}$$

Where:
Mean = mean thermal efficiency of the monitored ICSs

Given that variability is mostly dependent on the inherent characteristics of the units (ICS) and is not expected to be greatly affected by local conditions, the variation in efficiency across districts is thought to be lower than the variation within districts. For the example below, it is assumed that the efficiency is the same as the ICS for the first CPA, or 25.66%. The unit standard deviation is 4.5% and the average of within district standard deviation is 6.6%.[67] The number of ICS to be sampled from each district is set at 5 for the purposes of exemplifying the calculations and the thermal efficiency of the ICS model is 25.6%[68].

$$c \geq \frac{\left(\frac{0.045}{0.2566}\right)^2 \times \frac{28}{28-1} + \frac{1}{5} \times \left(\frac{0.066}{0.2566}\right)^2 \times \frac{\left(11{,}071-5\right)}{\left(11{,}071-1\right)}}{\left(\frac{0.1}{1.96}\right)^2 + \frac{1}{28-1} \times \left(\frac{0.045}{0.2566}\right)^2} = 13$$

Under this approach, the resulting number of districts to be sampled is 13 to achieve the required 95/10 confidence/precision. As a conservative measure, if the resulting sample data is found not to meet the 95/10 threshold then additional districts will be randomly selected to test ICS until the required 95/10 threshold is met.

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 CME may choose to use the same districts to monitor more than one parameter. For instance, the CME can sample SS_y, $n_{y,i}$ and $\eta_{newy,,i}$ –or a combination of these parameters- in the same district. To do this, the CME shall first randomly select a list of districts from the pool of districts in the database. The number of districts to select in this first stage corresponds to the largest district sample size obtained for any of the monitoring parameters. In the examples above, the largest district sample size required corresponds to parameter $\eta_{new,y,i}$ ($\eta_{new,y,i}$ needs a sample of 13 districts, while $n_{y,i}$ and SS_y only need 10 and 12 respectively). From this pool, the CME will randomly select districts for the parameters that require smaller district sample sizes. For example, from the initial pool of 13 districts where $\eta_{new,y,i}$ will be sampled, the CME would randomly select 12 districts to sample parameter SS_y. Likewise, from the

[67] The values were estimated using an Excel simulation of a pilot, where 6 districts are selected and 5 ICS are tested in each district for thermal efficiency. Random generators following a normal distribution were used to simulate the pilot. The simulation used a 6.4% standard deviation, which was estimated by multiplying the average coefficient of variation of thermal efficiencies of 5 stove models by the 25.66% efficiency of the ICS in the first CPA. The thermal efficiency values and standard deviations to estimate the coefficients of variation of the five stove models were obtained from: Partnership for Clean Indoor Air. "Test Results of Cookstove Performance." Pg. 112, accessed through: http://www.pciaonline.org/files/Test-Results-Cookstove-Performance.pdf

[68] 25.66% is the thermal efficiency (η_{new}) of the ICS used in the first CPA

same pool of 12 districts, the CME will randomly select 10 districts to sample $n_{y,j}$.. Sampling more than one parameter in the same district helps reduce travel needs for monitoring and the associated costs. At the same time this approach ensures the random selection of districts for every parameter, as districts are randomly selected.
If district sample sizes are the same for the three monitoring parameters, the random selection of districts would only be performed once for all parameters.
Water Boiling Tests for portable stoves may be conducted *in situ* or elsewhere, but using stoves whose users are located in the selected districts. In the same fashion, the surveys for $n_{y,j}$ and SS_y will be conducted in the same households – i.e. using the above example, both parameters will be assessed in 20 households for each districts.

(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 (SS_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 and same ICS model in this SSC-PoA. The method of collecting data will be field surveys of required sample size of ICS users in the database. Frequency of data collection is one survey per monitoring period. Data will be collected from the field surveys, entered in the database and included in the monitoring report. To monitor the efficiency of the stove at least every two years (as required by the AMS II.G version 5 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 5)**	**Methods to be applied**	**Comments on seasonal fluctuation**
$n_{y,j}$	Monitoring will likely occur every 12 months	No less frequently than every two years	Visits to the premises, visual inspection and interview with ICS end-user	Unlikely to be due to any seasonal fluctuation.
SSy	Monitoring will likely occur every 12 months	No less frequently than every two years	Visits to the premises, visual inspection and interview with ICS end-user.	Unlikely to be due to any seasonal fluctuation.
$\eta_{new,y,i}$	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 3.0 (or more recent at the discretion of the CME).	Not due to any seasonal fluctuation.

(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 to4 ICS[69]):

- 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 $\boldsymbol{n_{y,j.}}$ or $\boldsymbol{\eta_{new,y,i}}$) or, with a conservative approach according to the parameter definitions, the upper confidence bound of $\boldsymbol{SS_y}$.

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 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[70]. 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[71], the sampling may be repeated with an increased sample size. Alternatively, the CME may choose to apply the lower bound (or higher bound

[69] 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.
[70] 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)
[71] As per EB 69 Annex 5 paragraphs 258 to 314

according to the more conservative approach, as for example in the proportion of end-users who continue to use a baseline stove, SS_y) of the sampling results as is allowed for by the methodology (AMS II G v5, paragraph 28).

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 $\eta_{new,y,i}$ is continuous and therefore the presence of outliers is possible. The following approach will be used to identify and address outliers for the parameter $\eta_{new,y,i}$.

Because the sample size of parameter $\eta_{new,y,i}$ will by definition be 30 or above in any monitoring period, 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 SSC-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 5) 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 sampling Units[72]. The parameters are applied for emission reduction calculations as outlined in Part II Section B.6.3 SSC-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 ($\eta_{new,y,i}$) 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

[72] For avoidance of doubt, each CPA will produce a monitoring report using the appropriate monitoring parameters.

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 5, provides the option for annual or bi-annual 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.

(i) Assessment for Leakage

According to methodology II.G, version 5 paragraph 20, 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 SSC-PoA will use the 0.95 leakage adjustment factor instead of *ex-post* surveys.

The other source of leakage occurs if equipment currently being utilised is transferred from outside the boundary to the project activity. All ICS in the SSC-PoA will be newly manufactured/assembled or newly installed. Where second-hand/used ICS are distributed to an end-user the ICS will be from within the project (ie previously newly manufactured/assembled and either a demonstration model or transferred from one end-user within the project to another new or existing end-user). In both of these cases there will no equipment (ICS) being utilized outside the project area (any project non-participant) that is transferred to the project area (included as an ICS in the database) so leakage defined in paragraph 14 of the AMS II.G (version 5) methodology is not considered. Where second-hand/used ICS are transferred within the project area (between end-user project participants) the database will be updated to reflect this change to ensure there is no double counting of ICS.

(ii) Disposal of Low Efficiency Appliances and Use of Baseline Stoves

When an ICS is installed the end user receives information explaining that the conventional open fire appliance must no longer be used. Follow-up meetings with end users will ensure that those who have received an ICS are using it properly and that the conventional open fire is no longer in use. As per methodological condition 20 (b), if it is determined that the conventional open fire is still in use and the ICS is also in use, the wood used in conventional open fire will be subtracted from B_{old}. The number of households continuing to use a baseline stove in addition to their ICS, will be monitored throughout the project lifetime. This will be achieved using a single sample for in-use appliances ($n_{y,i}$) described above, and will meet EB 74 Annex 6confidence/precision requirements. The number of households continuing to use a baseline stove , in addition to their ICS, will be used to calculate the percentage of households with operational ICS that also use a baseline stove (*SSy*).

(iii) Monitoring Reporting

The CME will assess all monitoring data and produce a monitoring report 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.

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Appendix 1: Contact information on entity/individual responsible for the PoA

Organization	C-Quest Capital Malaysia Global Stoves Limited (CQC)
Street/P.O. Box	Brumby Centre Lot 42, Jalan Muhibbah
Building	Brumby Centre
City	Labuan
State/Region	FT
Postcode	87000
Country	Malaysia
Telephone	+6 087 423828
Fax	
E-mail	cqc-operations@cquestcapital.com
Website	www.cquestcapital.com
Contact person	Ken Newcombe
Title	
Salutation	
Last name	Newcombe
Middle name	
First name	Kenneth
Department	
Mobile	
Direct fax	
Direct tel.	+1-202-416-2400
Personal e-mail	cqc-operations@cquestcapital.com

Organization	Total LandCare (TLC) Malawi
Street/P.O. Box	PO Box 2440, Lilongwe
Building	Total LandCare, Area 14, Plot 100
City	Lilongwe
State/Region	Lilongwe District
Postcode	None
Country	Malawi
Telephone	+265 1 770 904 / 905
Fax	+265 1 770 919
E-mail	total.landcare.mw@gmail.com
Website	http://www.totallandcare.org
Contact person	Trent Bunderson
Title	Co-founder
Salutation	Dr.
Last name	Bunderson
Middle name	Trent
First name	William
Department	
Mobile	+265 999 838 072
Direct fax	
Direct tel.	
Personal e-mail	trentbunderson@yahoo.com

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 this the proposed SSC-PoA, or any CPA under the proposed SSC-PoA. If such public funding from Annex I parties to the UNFCCC is provided, the CME shall confirm that the funding is not a diversion of Official Development Assistance (ODA) [73].

[73] 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: Application of methodology(ies)

Evidence that the non-renewable biomass has been in use since 1989 (paragraph 3) and compliance with paragraph 17 and 19 of AMS.II.G. (version 5)

Paragraph 17 of AMS II.G methodology requires the demonstration of NRB through at least two supporting indicators. The fact that biomass is harvested from a net non-renewable source is supported by the following indicators:

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

Total living forest biomass carbon stocks have depleted from 173 million tons in 1990 to approximately 144 million tons in 2010, or by approximately 17 percent. The annual loss in carbon stock in living forest biomass is estimated between 1 and 2 million tonnes of carbon per year[74].

Trends in carbon stock in living forest biomass 1990-2010 - Malawi[75]

	Carbon stock in living forest biomass (million tonnes)					Annual change (million tonnes/yr)			Annual change per hectare (t/ha/yr)		
Country/area	1990	2000	2005	2010	Per hectare 2010 (tonnes)	1990-2000	2000-2005	2005-2010	1990-2000	2000-2005	2005-2010
Malawi	173	159	151	144	44	-1	-2	-1	n.s.	n.s.	n.s.

n.s. = not significant, indicating a very small value

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

The Malawi Integrated Household Survey gives an opportunity for analysing a trend that expands from 2004-2005 to 2010-2011 for the time it takes for collecting firewood. The average length of time it takes for a person aged 15 years plus to collect firewood has more than doubled in just five years, from 12 minutes a day in 2005 to 30 minutes a day in 2010.

Trends in Firewood Collection in Malawi, 2004-2005 and 2010-2011 (people over 15 years of age)				
Year	Source	Geographic Boundary	Avg. length of time collecting firewood per person **(minutes/day)**	Avg. length of time collecting firewood per person **(hours/week)**
2004/2005	National Statistical Office, Republic of Malawi[76]	National	12*	1.4
2010/2011	National Statistical Office, Republic of Malawi[77]	National	30***	3.5**

* The following value is calculated by taking the average weekly hours (1.4) as published in the report multiplied by 60 minutes in an hour then divided by 7 days in a week.

[74] Global Forest Resources Assessment 2010 (FAO) http://www.fao.org/forestry/fra/fra2010/en/ GLOBAL TABLES, Table 11

[75] *Ibid*

[76] Integrated Household Survey 2004-2005, Republic of Malawi PAGE 59 http://www.nsomalawi.mw/images/stories/data_on_line/economics/ihs/IHS2/IHS2_Report.pdf

[77] Integrated Household Survey 2010-2011, Republic of Malawi PAGE 95 http://www.nsomalawi.mw/images/stories/data_on_line/economics/ihs/IHS3/IHS3_Report.pdf

** The following value is calculated by taking the average daily hours (0.5) as published in the report multiplied by 7 days in a week.
*** The following value is calculated by taking the average hours/week (3.5) multiplied by 60 minutes in an hour then divided by 7 days in a week.

Paragraph 19 of AMS II.G (version 5) methodology requires project participants to provide evidence that the trends identified are not occurring due to the enforcement of local/national regulations:

Although a forest policy and legal framework was established starting in the mid to late 1990's for the conservation, management, protection and utilization of forest resources in Malawi[78], forest area continues to decline steadily according to FAO data presented above. The declining trends in the extent of forest area and carbon stocks occurred in the face of government efforts to protect such forest resources, evidencing the lack of enforcement of any existing regulation.

There are several documented reasons why regulations are not being enforced by the Malawian government bodies. Ultimately, these reasons stem from lack of resources[79], lack of human resource capacity[80], and a policy of tolerance that has been adopted in the face of high levels of poverty and food insecurity in local communities where regardless of legality, the forest activities are the only source of livelihood [8182]..

Paragraph 3 of AMS II.G (version 5) methodology requires project participants to show that non-renewable biomass has been used since 31 December 1989, using survey methods or referring to published literature, official reports or statistics.

Non-renewable biomass has been in use since December 31, 1989 as evidenced by various FAO statistical data. The Global Forest Resources Assessment 2010[83] (FAO) indicates that forest areas decline yearly, and that the total forest area declined by 27% from 1973 to 2010, as summarized in the table below. It is now estimated that the fraction of non-renewable biomass in total biomass is 97 percent[84].

Trends in extent of forest 1973-2010 - Malawi[85]

Area (1000 hectares)					
	1973	**1990**	**2000**	**2005**	**2010**
Forest	4456	3863	3567	3402	3237

In view of the combined evidence of declining forested areas since 1973, trend in loss in carbon stock since 1990, 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 since December 31, 1989 was from non-renewable sources.

[78] Luhanga, J. (2009) Malawi: The timber trade. South African Resource Watch. http://www.africafiles.org/article.asp?ID=20978 Section "Forest Policy"
[79] Ibid Section "Major Challenges to Forestry in Malawi"
[80] Ibid
[81] Nangoma, D. and Nangoma, E. Climate change and adaptation strategies: a case study of the Mulanje Mountain Forest Reserve and its surroundings. Mulanje Mountain Conservation Trust. Page 14
[82] Sibale, B. and Banda G. 2004. A study on livelihoods, governance and illegality: Law enforcement, illegality and the forest dependent poor in Malawi Forest Governance Learning Group, Malawi. PAGES 23 & 24
[83] FAO, Global Forest Resources Assessment 2010, Country Reports, Malawi PAGE 11
[84] C4 EcoSolutions, Improved Cooking Stove Programme (Malawi): Calculating the National Non-Renewable Biomass fraction (fNRB), March 2012. PAGE 6
[85] Ibid

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

The baseline fuel consumption survey of wood-burning rural households in Malawi was commissioned by CQC to HED and is of exclusive use by CQC. The full baseline report is uploaded together with the SSC-PoA-DD.

Appendix 5: Further background information on the monitoring plan

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History of the document

Version	Date	Nature of revision(s)
02.0	EB 66 13 March 2012	Revision required to ensure consistency with the "Guidelines for completing the programme design document form for small-scale CDM programmes of activities" (EB 66, Annex 13).
01	EB33, Annex43 27 July 2007	Initial adoption.
Decision Class: Regulatory **Document Type:** Form **Business Function:** Registration		