Programme of activities design document form
(Version 09.0)

BASIC INFORMATION	
Title of the PoA	Promoting Efficient Stove Dissemination and Use in West Africa
Version number of the PoA-DD	16
Completion date of the PoA-DD	14/07/2021
Coordinating/managing entity	Toyola Energy Limited
Host Parties	Burkina Faso Ghana Mali Senegal Togo
Applied methodologies and standardized baselines	AMS-II.G. Version 12, "Energy efficiency measures in thermal application of non-renewable biomass" No standardized baseline applied
Sectoral scopes	03: Energy demand (Mandatory), No conditional sector scopes are applicable

PART I. Programme of activities (PoA)

SECTION A. Description of PoA

A.1. Purpose and general description of PoA

(a) Policy/measure or stated goal that the PoA seeks to achieve

Fuel efficient biomass cook stoves are well proven to reduce greenhouse gas emissions, and to provide co-benefits to users and families in the form of relief from high fuel costs, reduced exposure to health-damaging airborne pollutants, faster cooking (resulting in time-savings), and increased cleanliness and convenience.

Currently inefficient and polluting cooking regimes are deeply entrenched throughout West Africa. Using carbon finance, this project aims to break this trend and move large populations away from conditions that emit large quantities of GHG emissions and cause harmful health effects for the women and children spending long hours each day in traditional kitchens.

Cooking practices are culturally specific, and successful dissemination of fuel-efficient stoves requires far more than simply manufacturing them for sale in markets. Users must be convinced from people whom they trust that such stoves can cook the same traditional food that has been cooked for generations. In some cases, advertising and retail sales will be sufficient to disseminate stoves. Yet in other cases, door-to-door sales, including partnering with women's associations to gain trusted champions of the technology is required. This program, and the carbon revenues that it generates, will champion culturally specific and appropriate sales models to ensure widespread stove dissemination and use.

The performance of efficient stoves can also be greatly affected by manufacturing quality, and therefore quality controls are a central component of such a program. Carbon finance will introduce a quality guarantee and an ongoing monitoring and evaluation component that is central to successful stove dissemination. The quality assurance strategy is a major benefit of carbon finance. It has the potential to introduce a new set of quality expectations among consumers, thereby shifting the critical mass of prevailing practice away from inefficient cooking, to prevailing practice involving significantly reduced GHG emissions and less-polluted kitchens. The quality assurance system will extend the working lifetime of the stoves and in some cases, offer warranties that help ensure long term use in the field. The project proponents expect this strategy to help secure customer loyalty and promote a shift of customer preference toward high-efficiency stoves. The effect will be to galvanize competition in the same direction.

Finally, upfront cost of efficient stoves is a major inhibitor to widespread stove dissemination. Therefore, carbon finance will, in some cases, be used to subsidize the sale price of stoves to end users, allowing manufacturers to sell stoves below cost so that they are cost competitive with their inefficient counterparts. This will enable even the poorest members of society to access the technology.

Although these stove dissemination measures will often be consistent with national government development priorities, the program will not be implemented in any areas where such technology is mandated by law. Indeed, there are currently no host countries in this PoA that mandate the use of efficient stove technology.

(b) Framework for the implementation of the PoA

This CDM Programme of Activities seeks to reduce greenhouse gases emissions by disseminating, throughout West Africa, stoves that use charcoal and wood more efficiently. The offsets will be realized by a reduced consumption of woody biomass by households, commercial entities and institutions in a host country.

Fuelwood and charcoal (together referred to as wood fuel) meet an overwhelming majority of fuel requirements in West Africa. Although wood continues to dominate energy consumption, charcoal use in both rural and urban areas is increasing. Fuel-switching from wood to charcoal in city centers is primarily due to changes in the socioeconomic characteristics of urban households that make charcoal a more attractive fuel. The PoA's aim is not to promote fuel switching, as this may result in higher emissions when wood users turn to charcoal, but to use both fuels efficiently. Improved wood stoves will be promoted in areas where wood dominates and charcoal in areas where charcoal is predominantly used.

Multiple categories of stoves will be marketed and sold on a large-scale under the programme (the list below is not exhaustive):

a. improved charcoal stoves for household use and commercial/institutional use
b. improved wood stoves for household us and commercial/institutional use

Toyola Energy Limited is the coordinating and managing entity of the project. It will contract with CPA implementers in each of the 5 countries or play the role of a CPA implementer in many cases. CPA implementers are in charge of importing or manufacturing project stoves, selling them to end users, tracking sales and reporting them back to Toyola Energy using tools developed together with Toyola.

Toyola Energy is responsible for drafting project documents, calculating emissions reductions, hiring DOE for validation and verification and overseeing an independent third party to conduct monitoring tasks as outlined in the monitoring plan. Toyola Energy will also manage the sale of CER and the allocation of revenues among CPA.

(c) Confirmation that the PoA is a voluntary action by the coordinating/managing entity

Toyola Energy, the coordinating and managing entity, is a project developer and is therefore not obligated to undertake the proposed PoA. Additionally, all host parties are voluntarily participating in the project activity as there is no law in any of them that mandate the use of efficient cooking technology. This was confirmed during discussions with the respective Designated National Authorities

(d) PoA contribution to sustainable development of host party

Sustainable Development Benefits:

Impact on the Environment

- Climate Change: The new clean energy products will increase energy efficiency of the household use and commercial/institutional. The stoves reduce the amount of fuel required to cook. This will result in less Greenhouse gas emissions from burning non-renewable biomass and will have a positive effect on climate change.
- Local Environment: Through the introduction of the more efficient stoves technologies will result in the reduction of pollution caused by particulate matter released during the burning of traditional fuels (biomass and charcoal).
- Natural Resource Use: The use of wood to cook food causes pressure on the forests. The introduction of more efficient stoves will result in a reduction in deforestation, as reliance on non-renewable fuel sources is reduced.

Impact on Society

- Poverty Alleviation: PoA utilizes efficient stoves, leading to reduces cost of spending on wood, ensuring that less money is spent on fuel and more money can be saved for other uses.
- Equity: This programme allows for low-income households to afford these desired clean energy products which increase fuel savings and means less money is spent on fuel each year and there is more money to be spent on other things.
- Health: The efficient stoves reduce particulate matter emissions and families no longer inhale indoor smoke that causes respiratory illnesses and the risk of burns from falling into fires is reduced. These will have a positive effect on the health of the project participants who will inhale less smoke.
- Improving Ecological Education: The implementation of this project increases awareness amongst project participants about deforestation and climate change.

Impact on Economy and Technology

- Efficient Resource Utilization: PoA is making use of carbon finance to help alleviate the costs of client education and marketing, internal training and capacity building,aftersales service and maintenance.

Transfer of Technology and Knowhow: The installation of stove will be done with local people who will learn about how the technology works. In some cases, the assembly of the stove will also be done by local people who will learn about the stoves.

All Designated National Authorities have stated in their Letter of Approval that the project contributes to the sustainable development of their country. Woodfuel harvesting is a major driver of deforestation and biodiversity loss in all the countries in the PoA, yet, woody biomass remains the principal cooking fuel. While countries find ways of replacing woody biomass with cleaner alternative fuels, a reduced consumption remains the only interim and viable solution.

A.2. Physical/geographical boundary of PoA

The PoA will be located in urban, peri-urban and rural areas of Burkina Faso, Mali, Senegal, Togo and Ghana.

The PoA boundary is the physical, geographical site within the host countries where the improved biomass cook stoves will be used.

	Latitude	Longitude
Burkina Faso	12.1204° N	1.7841° W
Mali	14.8128° N	5.5030° W
Senegal	14.6943° N	15.5953° W
Togo	8.3357° N	1.0495° E
Ghana	7.4490° N	0.9056° W

A.3. Technologies/measures

The PoA will be implemented using the small-scale methodology AMS-II.G. Version 12, "Energy efficiency measures in thermal application of non-renewable biomass". During the design of the ICS, below attributes were envisaged:

- Around 3 billion people still cook using solid fuels (such as wood, crop wastes, charcoal, coal and dung) and kerosene in open fires and inefficient stoves. Most of these people are poor, and live in low- and middle-income countries[1]. Every year, 2 million people – mostly women and children – die as a result of indoor air pollution from household burning of solid fuels such as dung, wood, crop waste and coal in unventilated kitchens.[2]
- Efficient cookstoves generate the following sustainable development benefits:
    - Environmental: reduces carbon emissions associated with burning wood and coal, reduces air pollution from particulate matter released by stoves, and reduces deforestation that results from collection of wood for fuel
    - Health: families no longer inhale indoor smoke that causes respiratory illnesses and the risk of burns from falling into fires is reduced
    - Education: children that previously spent hours collecting firewood each day now have more time to attend school and study
    - Economic: generates households' savings from reduced fuel expenditures and enables to spend less time collecting fuel and more time engaged in income-generating activities

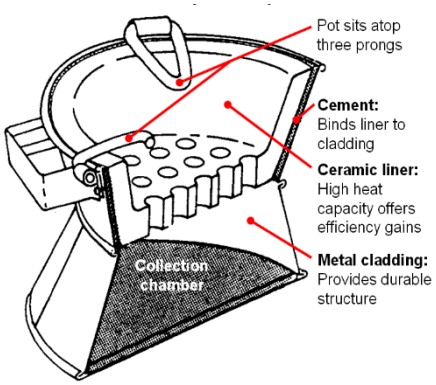
Summary of technologies to be implemented by CPAs under the POA

This project will disseminate charcoal and firewood stoves that are more efficient than traditional stoves and as a result, reduce emissions of GHG. The efficient stoves can be portable or stationary; one-pot or multi-pot. Some of them are described herein and others will be added in their specific CPA as the PoA expands.

Most improved charcoal stoves reduce fuel consumption by introducing a ceramic liner that increases combustion efficiency and retains heat. In many countries, the stove consists of hourglass shaped metal cladding with perforated interior ceramic liner that allows ash to fall into the collection chamber at the base. A thin layer of cement is placed between the cladding and the liner. During use, a single pot rests at the top of the stove. Most stoves in the region are variants of the Kenya Jiko stove. They include the Toyola stove in Togo, the Diambar stove in Senegal, the Sewa in Mali and the Toyola Coalpot in Ghana. All these are portable stoves. Other variations of this stove will be employed in other West Africa nations.

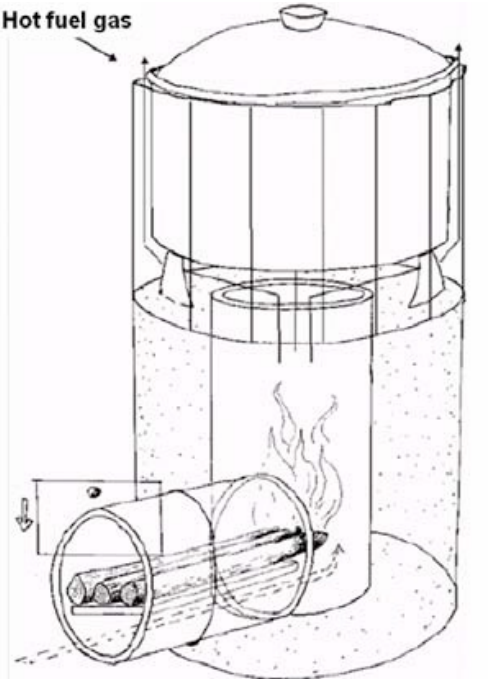
[1] https://www.who.int/news-room/fact-sheets/detail/household-air-pollution-and-health

[2] UNDP. "Fast Facts: UNDP and Energy Access for the Poor," UNDP, New York, NY, October 2010.



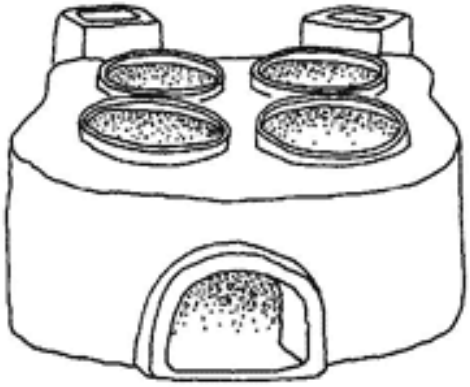
Cross section of the Toyola stove

Other wood stoves use efficient design that enables complete combustion of biomass fuels, thereby dramatically improving efficiency. An example of this is the rocket stove, which has been used on a pilot basis in various parts of Africa and elsewhere. A rocket stove features a tall cylinder and an elbow joint at the bottom. Wood fuel is fed into the elbow joint and fuel is burned in a controlled fashion in the tall combustion cylinder, atop which the pot rests. Variations of this portable stove will be employed throughout West Africa based on local cultural preferences and available fuels.



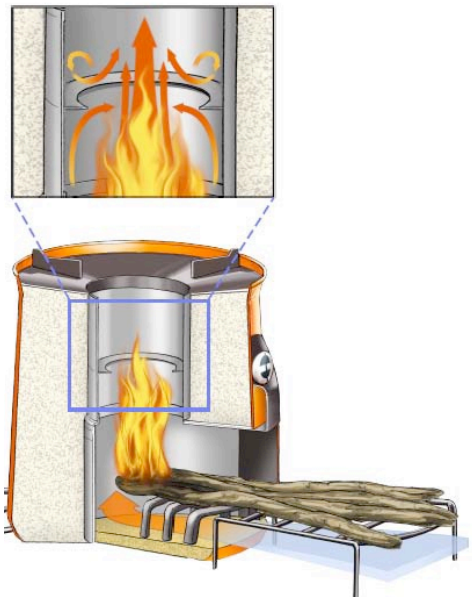
Technical Drawing of the Rocket Stove

Commercial wood stoves that are used to brew millet beer or process shea butter will be disseminated to replace 3-stone open fires. These stationary stoves, commonly known as improved “dolo” stoves, are made out of mud bricks that form a circular “wall” that allows an efficient burning of wood. Improved “dolo” stoves use about 50% less fuel than 3-stone open fires.



Technical Drawing of "dolo" stove

The Envirofit G3300 wood stove is a specific type of rocket stove. A detachable pot skirt replaces the built in pot skirt on many rocket stoves.
Envirofit uses a metal alloy in its combustion chamber that maximizes heat transfer and ensures durability.
The efficiency of stoves will be declared at CPA level (under CPA-DD or MR) with the help of technical specifications, testing records, laboratory tests as applicable.



Technical Drawing of the Envirofit Stove G3300

How the technology and know-how for their use are transferred to the host parties
Most of the technologies promoted in the PoA are locally manufactured by artisans and business that master the know-how but are lacking the financing or the marketing support to scale up. In cases where the technology is not from the host country, local manufacturing centers will be gradually created to transfer the technology to the host country.

A.4. Coordinating/managing entity

Toyola Energy Limited is the coordinating/managing entity ("CME") for this SSC-PoA. The CME will communicate with the Executive Board and/or the pertinent Designated Operational Entity ("DOE") on all matters, including submission of the PoA and making arrangements for the distribution of certified emission reductions.

A.5. Parties and project participants

Parties involved	Project participants	Indicate if the Party involved wishes to be considered as project participant (Yes/No)
Togo (host Party)	Private entity – Toyola Energy Limited	No
Burkina Faso (host Party)	Private entity – Toyola Energy Limited	No
Senegal (host Party)	Private entity – Toyola Energy Limited	No
Mali (host Party)	Private entity – Toyola Energy Limited	No
Ghana (host Party)	Private entity – Toyola Energy Limited	No
Sweden	Swedish Energy Agency	No

A.6. Public funding of PoA

There is no public funding to implement the PoA

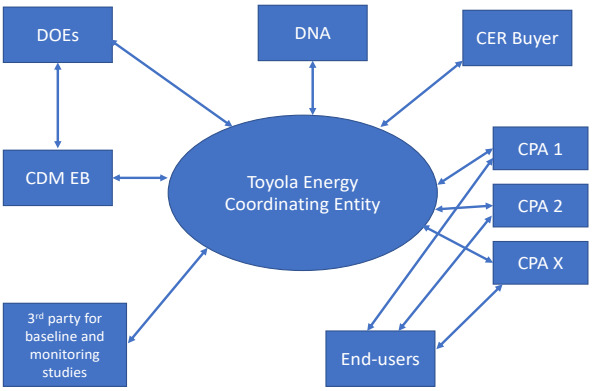
SECTION B. Management system

Toyola Energy is the Coordinating Entity and the project developer of this PoA. It is responsible for recruiting CPA implementers; for overseeing 3rd party organizations to perform baseline studies and monitoring tasks; for hiring DOE to conduct validation and verification; for communicating with the CDM Executive Board; for finding CER buyers and for distributing CER revenues to CPA implementers.

CPA implementers will primarily be stove manufacturers and distributors or non-governmental organizations that are interested in promoting efficient cooking appliances.

CPA implementers are legally obligated to fulfil certain duties by a contractual agreement with Toyola Energy[3]Toyola Energy that gives Toyola EnergyToyola Energy rights to sell CER on their behalf, that outlines the conditions of participation in the PoA.

[3] CME hereby clarifies that it will follow the same management practices as per the registered POA DD. Declaration CDM-CME-FORM is already provided to UNFCCC while updating the CME change.



(i) Roles and responsibilities for inclusion of CPA

The CME is responsible for assessing each CPA prior to submitting it for inclusion. This includes evaluating manufacturing and distribution capacity of the CPA implementer, reviewing efficiency test for the stoves (if applicable) and reviewing baseline studies for the CPA (if applicable). The CME will also do a technical review on each CPA prior to inclusion. This includes ensuring that the CPA is not registered as its own CDM project activity or included in another PoA, ensuring that the CPA meets the eligibility criteria of the PoA, reviewing PDDs, etc. The CME staff is comprised of seasoned carbon finance professionals who have the credentials to undertake this role.

Records of arrangements for training and capacity development for personnel In CPAs that promote locally manufactured stoves, training of new manufacturers will be performed by the CPA implementer or a partner organization. Sales staff for both locally manufactured and imported stoves will be trained by the CPA implementer. Information related to the use and maintenance of the stoves will be delivered to end users through demonstrations or included in a user guide that accompanies the stove. Each CPA will develop training and maintenance processes that are appropriate to the type of stove it promotes and to its target market.

(i) Procedure for technical review of inclusion of CPAs.

The CME will conduct a technical review of all CPA prior to submitting CPA -DD and supporting documents to a DOE who will proceed to the validation of the CPA, including an additional technical review. These reviews will be done prior to submitting the CPA for inclusion.

(ii) Procedure to avoid double counting

Contractual agreements between the Coordinating Entity and CPA Implementers will be complemented with second-tier contracts. These are contracts between CPA implementers and secondary industry players that ensure that these players are not selling rights to emissions reductions for the same stoves. In this way, each CPA will be able to provide a paper trail down to the end user level that shows transfer of ownership rights to emission reductions, which will avoid any instances of double counting.

Moreover, every stove will carry the programme logo as well as a unique identification that indicates the CPA it belongs to. Each stove sold will be recorded in a database and identified by its type, size and serial number. Finally, each stove's identification will be cross referenced to guarantee that no double counting has occurred. The database will be populated by the CPA implementer and managed by the CME.

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

CPA implementers will maintain records on end user contact information, stove sales data and other inventory information in a manner that enables Toyola Energy and DOE to verify that sales are indeed occurring and stoves are being used in businesses, institutions and households within the border of the host countries that results in a decrease in greenhouse gas emissions. This data will be collected by CPA implementers with assistance from the Coordinating Entity to ensure that data is collected correctly and organized in a useable fashion. Each CPA will have its own database that is periodically transferred to Toyola Energy via e-mail. Data to be collected include:

-Stove size
-Stove type
-Date of sale
-Stove serial number
-Name of customer
-Address of customer (if customer is willing to provide)
-Phone number (if customer is willing to provide)

For stationary stoves, in addition to sale data mentioned above, the following information will be collected:
-date of installation
-name of installer

In addition to the sales database, Toyola Energy will store results of surveys and stove tests in a secure server for monitoring purposes and will keep the records until 2 years after the end of the crediting period or the last issuance of CER for the PoA, whichever occurs later.

(iv) Measures for continuous improvements of the PoA management system
Internal audit of all the records of the distribution, monitoring and education activities will be carried out once a year by the CPA implementer or the CME. In addition, a DOE will conduct periodic verifications. During these verifications all the data and parameters that need to be monitored as per the monitoring plan will be checked and shortcomings, if any, will be reported and addressed. The CME will respond to all DOE Forward Action Requests during the validation and verification periods.

(v) Any other relevant elements.
Outsourced Monitoring process (in case deemed necessary and as applicable)
3rd party experts may be engaged as applicable for monitoring
the parameter Ny,i,j and $_{ny,i,j}$ and other parameters that are calculated.
Specifically, the 3rd party will test the efficiency of project stoves, visit households to assess the usage rate the project stoves as well as the portion of project stove owners that still use their baseline stoves and all other forms of leakage. The sales database and the end user database will serve as sampling frame for all these studies. The 3rd party will compile its findings in a report which is submitted to CME. These findings form the basis of the Monitoring Report drafted by CME and presented to a DOE for verification. The involvement of CME and the CPA implementers in this process will be kept to a minimum to avoid influencing the 3rd party.

SECTION C. Demonstration of additionality of PoA

Firewood and charcoal meet an overwhelming majority of the energy needs of households, businesses and institutions in West Africa while the regeneration rate of forests in this region does not sustain this need. This leads to acute deforestation as well as loss of biodiversity and significant emissions of greenhouse gases. Moreover, the burning of firewood and charcoal in rudimentary cooking appliances leads to smoke inhalation, which causes respiratory diseases. Nonetheless, there is no policy or regulations that mandate the use of improved and clean burning biomass cook stoves in any of the host countries of this PoA.

The proposed PoA is a voluntary coordinated action;

The proposed PoA is a voluntary action by the coordinating entity, the project participants and the host countries. There are no mandatory policies in Togo, Burkina Faso, Senegal, Mali and Ghana that require the use of improved cook stoves

The voluntary coordinated action would not be implemented in the absence of the PoA;
There are no laws or regulations in the geographical/physical boundary of the PoA requiring the activities of the PoA. The activities under the PoA are a voluntary, coordinated action by the CME of the PoA.

The voluntary coordinated action implemented by the CME would not occur in absence of the PoA.

The action is not financially viable without the support of revenues from the sale of CERs. Financial support from the CDM is required in order to develop, disseminate, and ensure continued operation of the activity proposed under the PoA.

A dissemination of improved cook stoves at the scale envisioned by the PoA would not occur in the host countries in the absence of the PoA because of investment and technological barriers faced by improved cook stoves in the host countries (detailed below). As described above, the use of rudimentary cooking appliance such as the 3-stone fire and traditional metal and clay stoves is predominant in the host countries because they are widely available, easy to manufacture and very affordable. Yet, their use results in high emissions of greenhouse gases. Improved cookstoves on the other hand require a specialized skill set, special infrastructures and raw materials and are significantly more expensive. The intervention of different governmental and non-governmental agencies in building human capacity around the improved cook stove sector and in providing subsidies to the sector attest to the existence of these barriers and to a need for more coordinated and more sustained action. The PoA will provide financial and technical resources to sustain the production and maintenance of improved cookstoves as well as subsidies to end-users.
To date, no program has been put forth to undertake the voluntary action at the geographical and time scale proposed by the PoA. Therefore, it would not be implemented without the PoA.

Additionality is established using

- Tool 21- Demonstration of additionality of small-scale project activities Version 13.1 (refer option 03 of the methodology para 21) and/ or
- Tool19 – Demonstration of additionality of microscale project activities, Version-9, (refer option 02 of the methodology para 22) and/ or
- Option 1 (Positive List) as per para 17 to 20 of the applied methodology

CPAs under the PoA shall include eligibility criteria derived from the relevant requirements of this guideline. The CPA's may choose Route 1, Route 02 or Route 03 as applicable to demonstrate the additionality at the time of inclusion.

Route 01 ***(refer option 03 of the methodology para 21)*****:** Tool 21-Methodological Tool on the Demonstration of Additionality of Small-Scale Project Activities Version 13.1, para 10

10. Project participants shall provide an explanation to show that the project activity would not have occurred anyway due to at least one of the following barriers[4] :
(a) Investment barrier: a financially more viable alternative to the project activity would have led to higher emissions;
(b) Technological barrier: a less technologically advanced alternative to the project activity involves lower risks due to the performance uncertainty or low market share of the new technology adopted for the project activity and so would have led to higher emissions;
(c) Barrier due to prevailing practice: prevailing practice or existing regulatory or policy requirements would have led to implementation of a technology with higher emissions;
(d) Other barriers: without the project activity, for another specific reason identified by the project participant, such as institutional barriers or limited information, managerial resources, organizational capacity, financial resources, or capacity to absorb new technologies, emissions would have been higher.

Route 02 ***(refer option 02 of the methodology para 22)*****:** *Tool 19:* Demonstration of additionality of microscale project activities, version 09 para 11 (c), 12 (a), 12(b) and 13 (b) are tabulated below:

Reference	Requirement	Conformance
Tool 19: Demonstration of additionality of microscale project activities , version 09		
Para 11 (c) The project activity consists of one or more of the following technologies/measures [5] for distributed energy generation (not connected to a national or regional grid) where end users are households, communities or small and medium-sized	The PoA is dissemination of ICS, thus this condition is not fulfilled	Not applicable as requirement is not met

[4] Project participant may like to refer to "Non-binding best practice examples to demonstrate additionality for SSC project activities" (EB 35 Annex 34).

[5] A stakeholder may propose additional technologies/measures to be added under positive list requesting a revision to this methodological tool.

enterprises (SMEs); (i) Solar technologies (photovoltaic and solar thermal electricity generation); (ii) Building-integrated wind turbines or rooftop wind turbines; (iii) Micro/pico-hydro; (iv) Micro/pico-wind turbine; (v) PV-Wind hybrid; (vi) Geothermal; (vii) Biomass gasification/biogas; (viii) Solar water heating system;[6] (ix) Clean and energy efficient cookstoves.[7]		
Para 12 Energy efficiency project activities that aim to achieve energy savings at a scale of no more than 20 GWh per year are additional if any one of the conditions below is satisfied: 12(a) The geographic location of the project activity is in an LDC/SIDS or SUZ of the host country;	The PoA involves • Bukrina Faso • Mali • Senegal • Togo which are listed under UN list of least developed countries (https://unctad.org/topic/least-developed-countries/list)	Applicable
Para 12 Energy efficiency project activities that aim to achieve energy savings at a scale of no more than 20 GWh per year are additional if any one of the conditions below is satisfied: Para 12(b) The project activity consists of one or more of the following technologies / measures[8] related to energy efficiency where end users of the technology/measure are households, communities or SMEs: (i) High efficiency biomass fired devices (e.g. energy efficient cookstoves);[9] (ii) Micro-irrigation systems; (iii) Energy efficient pump-set for agriculture	The PoA disseminates the ICS. This additionality demonstration criteria can be applied to Ghana.	Applicable

[6] Further conditions to check the penetration rate as specified in appendix of this document applies.

[7] See footnote 10 above

[8] A stakeholder may propose additional technologies/measures to be added under positive list requesting a revision to this methodological tool.

[9] Further conditions to check the penetration rate as specified in appendix of this document applies.

Requirements of penetration rate:		
13 (b) The project activity consists of one or more of the following technology/measures[10] related to an emission reduction activity where end users of the technology/measure are households, communities or SMEs: (i) Solar lamps;[11] (ii) Biogas digesters.	The PoA disseminates the ICS and does not entrail technology/measure of solar lamps or bio digesters	Not Applicable

Route 03 (para 17 to 20 of the applied methodology)-

17. Demonstrate ex ante that the penetration[12] of high efficiency biomass fired devices (e.g. energy efficient cookstoves[13]) is equal to or less than 5 per cent of the technologies/measures providing similar services in the region in order to be considered as automatically additional.

18. The penetration shall be determined using one of the following options:

    (a) Official statistics or reports, relevant industry association reports or peer-reviewed literature;

    (b) Results of a sampling survey conducted by project participants/CME or a third party as per the latest version of "Standard: Sampling and surveys for CDM project activities and programme of activities" covering technologies/measures providing similar services as the project technology/measure;

19. The region/applicable geographical area to determine the penetration should be the entire host country. If the project participants opt to limit the applicable geographical area to a specific geographical area (such as province, region, etc.) within the host country, then they shall provide justification on the essential distinction between the identified specific geographical area and rest of the host country.

20. To determine the penetration using the above paragraph, the most recent data available at the time of submission of the CDM-PDD or CDM-CPA-DD for validation/inclusion, shall be used, and the data vintage used shall not include data older than three years prior to: (a) the start date of the CDM project activity; or (b) the start of validation/inclusion, whichever is earlier.

Below is the calculation of energy savings for one of the smallest and one of the largest stoves identified for the PoA so far. The energy savings are between 0.0079 GWh and 0.3485 GWh which are well below the 9 GWh limit. Therefore, the PoA and each of its CPA are automatically additional.

Ceramic-lined stove

Energy savings (Sample =calculation) =

[10] A stakeholder may propose additional technologies/measures to be added under positive list requesting a revision to this methodological tool.

[11] Further conditions to check the penetration rate as specified in appendix of this document applies.

[12] Refers to proportion of stock of functional equipment at the user end; also termed as market saturation.

[13] In accordance with paragraph 0, consider all single pot or multi pot portable or in-situ cookstoves with rated efficiency of at least 20 per cent or higher.

$B_{y,saving,i,j} = B_{old,i,j} \times L_y \times [1- (\eta_{old,i,j}/\eta_{new,i,j})]$

$(B_{y,\ savings,i,j.} * leakage) * NCV_{biomass}$

$= [B_{old,i,j}*(1- \eta_{old,i,j} / \eta_{new,i,j})]*leakage * NCV_{biomass}$

Parameter	Unit	Description	Value	Source
$B_{old,i,j}$	Tonnes/year	Annual quantity of woody biomass in baseline	5.2	"Update to the Baseline of the PoA "Promoting Efficient Stove Dissemination and Use in West Africa" For Togo" (March 2020) - page 5, table 5. This value is used for the sample calculation though the value of Bold is to be updated/determined at the time of CPA inclusion.
$\eta_{old,i,j}$	fraction	Average Efficiency Malgache/Clay Household stove	0.211	"Results of the Stove Test Series Performed for E+Carbon" (May 2011) -page 12 and "Summary of UEMOA Tests" page 3
$\eta_{new,i,j}$	fraction	Average efficiency Toyola Household stove	0.341	Monitored thermal efficiency of stove of age 1 from 2017 WBT report for Togo (page 19)
Leakage	fraction	Adjustment factor to account for leakage	0.95	Methodology
$NVC_{biomass}$	TJ/tonne	Net calorific value of the non-renewable woody biomass that is substituted	0.0156	Methodology
$NVC_{biomass}$	GWh/tonne	Energy Equivalent of Net calorific value of the non-renewable woody biomass that is substituted	0.00417	Calculated

$B_{y,savings,i,j}$ = [5.2 * (1-0.211/0.278)]*0.95

= 1.898

Energy savings =1.898 * 0.00417

=0.0079 GWh/year

Institutional Rocket Stove

Energy savings= $(B_{y,\ savings,i,j.} * leakage) * NCV_{biomass}$

= [By,saving,i,j = Bold,i,j x Ly x [1- (ηold,i,j/ηnew,i,j)]

$B_{old,i,j}*(1- \eta_{old,i,j} / \eta_{new,i,j})]*leakage * NCV_{biomass}$

Parameter	Unit	Description	Value	Source
$B_{old,i,j}$	Tonnes/year	Annual quantity of woody biomass in baseline	121	Estimates from E+Carbon stove project in South

				Africa. This value is used for the sample calculation though the value of Bold is to be updated/determined at the time of CPA inclusion.
$\eta_{old,i,j}$	fraction	Efficiency of the system being replaced (3 stone fire)	0.10	Methodology
$\eta_{new,i,j}$	fraction	Efficiency of the system being deployed by the project activity	0.367	WBT on Rocket Stove[14]
Leakage	fraction	Adjustment factor to account for leakage	0.95	Methodology
$NVC_{biomass}$	TJ/tonne	Net calorific value of the non-renewable woody biomass that is substituted	0.015	Methodology
$NVC_{biomass}$	GWh/tonne	Energy Equivalent of Net calorific value of the non-renewable woody biomass that is substituted	0.00417	Calculated

$B_{y,savings}$ = [121 * (1-0.10/0.367)]*0.95
= 83.628

Energy savings =83.628 * 0.00417
=0.3485 GWh/year

SECTION D. Start date and duration of PoA

D.1. Start date of PoA

24/02/2011

D.2. Duration of PoA

28 years, 0 months

SECTION E. Environmental impacts

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

Environmental Analysis is done at CPA level.

Due to the geographically diverse nature of this PoA, the Coordinating Entity proposes to perform environmental analyses at the CPA level. In addition to there being variations of national environmental laws that should be considered at the CPA level, raw materials harvesting and effects on local forest resources will also vary, making it more appropriate to conduct environmental analyses at the CPA level. One EIA can be done for a group of CPA if they are located in the same host country are subject to the same environmental laws.

E.2. Analysis of environmental impacts

Not applicable

E.3. Environmental impact assessment

Not applicable

SECTION F. Local stakeholder consultation

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

Local stakeholder consultation is done at SSC-CPA level.

Due to the geographically broad nature of this PoA, the Coordinating Entity proposes to conduct stakeholder consultations at the CPA level. A single stakeholder consultation can be held for multiple CPA located in the same host country provided that the type of cook stove promoted by each CPA is well presented and all the CPA are included within 5 years of the date the meeting was held.

F.2. Modalities for local stakeholder consultation

Not applicable

F.3. Summary of comments received

Not applicable

F.4. Consideration of comments received

Not applicable

SECTION G. Approval and authorization

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- The letters of approval from the five host countries, Togo, Burkina Faso, Mali, Senegal and Ghana are available and submitted to the DOE.
- Toyola Energy is the only project participant listed in the PoA-DD. It is authorized by the Republic of Ghana to be a project participant. The letter has been submitted to the DOE.
- Toyola Energy is authorized as a CME by Ghana, Mali, Senegal and Togo in the same letter as the approval letter and by Burkina Faso in a separate letter. All letters have been submitted to the DOE

PART II. Generic component project activity (CPA)

SECTION H. Description of generic CPA

H.1. Title of generic CPA

Promoting Efficient Stove Dissemination and Use in West Africa- Generic CPA

H.2. Reference number of generic CPA

Generic CPA 1(example 9666-P1-XX -CP2)

H.3. Purpose and general description of generic CPA

a) Purpose of the generic CPA

A typical SSC CPA under this PoA will be comprised of measures to facilitate increased dissemination and use of efficient cook stoves in rural, peri-urban and urban West African communities. The measures will be targeted to overcome barriers to efficient cooking technology's application that are specific to each CPA. In some cases, there may be capacity barriers in manufacturing, distribution, marketing or other key areas. In other cases, market players may lack access to sufficient capital to grow distribution channels. Some communities and prospective users may be unwilling to adopt new and unfamiliar technology. Cooking technology is culturally specific and infiltration into the community is often needed to present sufficient evidence that efficient technologies can produce the same or superior results to more traditional methods.

A typical CPA would result in the manufacture, distribution and sale of tens of thousands of new efficient stoves in a given region or nation, resulting in dramatic decreases in greenhouse gases, fuel wood harvesting from forests and indoor air pollution. Target groups can be households, commercial entities or institutions or a mix of all.

Each CPA will be differentiated with other CPA by a serial numbering protocol that identifies the host country and the CPA number. The first two characters on stove's serial number are related to the country and the order of the CPA. For instance, for the first CPA in Togo, the serial number starts with T1 (T=Togo; 1=CPA 1). If the second CPA is in Burkina Faso, the serial number will start with B2 (B=Burkina Faso; 2= CPA 2). Each stove will also carry the programme logo as a way of identifying the PoA. The CPA-DD will clearly identify the host country and describe the general area where the CPA will be implemented.

b) Summary of the technologies implemented by corresponding CPA

A typical CPA will deploy cooking stoves that use non-renewable biomass as a fuel (firewood or charcoal) and consume significantly less fuel than the baseline stoves they seek to replace.

Sustainable Development Benefits:

Impact on the Environment

- Climate Change: The new clean energy products will increase energy efficiency of the household use and commercial/institutional. The stoves reduce the amount of fuel required to cook. This will result in less Greenhouse gas emissions from burning non-renewable biomass and will have a positive effect on climate change.
- Local Environment: Through the introduction of the more efficient stoves technologies will result in the reduction of pollution caused by particulate matter released during the burning of traditional fuels (biomass and charcoal).
- Natural Resource Use: The use of wood to cook food causes pressure on the forests. The introduction of more efficient stoves will result in a reduction in deforestation, as reliance on non-renewable fuel sources is reduced.

Impact on Society

- Poverty Alleviation: CPA utilizes efficient stoves, leading to reduces cost of spending on wood, ensuring that less money is spent on fuel and more money can be saved for other uses.
- Equity: This CPA allows low-income households to afford these desired clean energy products which increase fuel savings and means less money is spent on fuel each year and there is more money to be spent on other things.
- Health: The efficient stoves reduce particulate matter emissions and families no longer inhale indoor smoke that causes respiratory illnesses and the risk of burns from falling into fires is reduced. These will have a positive effect on the health of the project participants who will inhale less smoke.
- Improving Ecological Education: The implementation of this project increases awareness amongst project participants about deforestation and climate change.

Impact on Economy and Technology

- Efficient Resource Utilization: CPA under PoA is making use of carbon finance to help alleviate the costs of client education and marketing, internal training and capacity building,aftersales service and maintenance.

Transfer of Technology and Knowhow: The installation of stove will be done with local people who will learn about how the technology works. In some cases, the assembly of the stove will also be done by local people

who will learn about the stoves.

The SSC-CPA project type will be Type II (microscale project type - project activities that aim to achieve energy savings at a scale of no more than 20 GWh per year[15]).

H.4. Technologies/measures

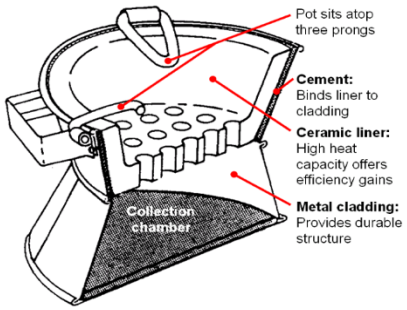
The technologies to be used under this generic CPA are the same describe in section A.3 of the PoA DD above.

1. Technologies to be implemented by the corresponding CPA

(a) List of systems that will be installed by the CPA

This project will disseminate charcoal and firewood stoves that are more efficient than traditional stoves and as a result, reduce emissions of GHG. The efficient stoves can be portable or stationary, one pot or multi-pot. Some of them are described herein and others will be added in their specific CPA as the PoA expands.

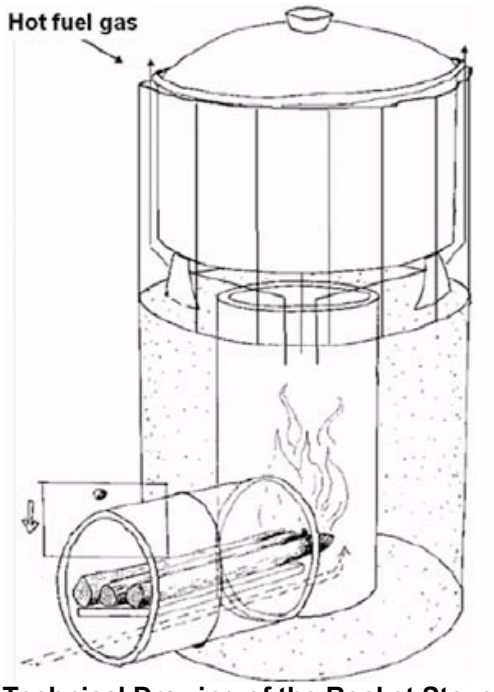
Most improved charcoal stoves reduce fuel consumption by introducing a ceramic liner that increases combustion efficiency and retains heat. In many countries, the stove consists of hourglass shaped metal cladding with perforated interior ceramic liner that allows ash to fall into the collection chamber at the base. A thin layer of cement is placed between the cladding and the liner. During use, a single pot rests at the top of the stove. Most stoves in the region are variants of the Kenya Jiko stove. They include the Toyola stove in Togo, the Diambar stove in Senegal, the Sewa in Mali and the Toyola Coalpot in Ghana. All these are portable stoves. Other variations of this stove will be employed in other West Africa nations.



Cross section of the Toyola stove

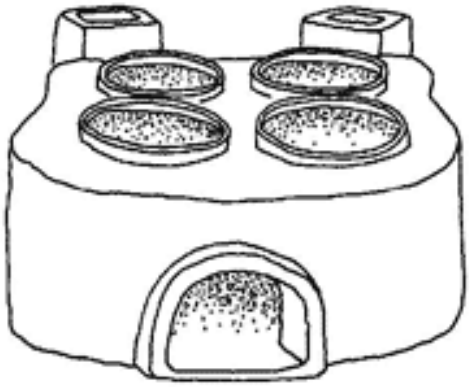
Other wood stoves use efficient design that enables complete combustion of biomass fuels, thereby dramatically improving efficiency. An example of this is the rocket stove, which has been used on a pilot basis in various parts of Africa and elsewhere. A rocket stove features a tall cylinder and an elbow joint at the bottom. Wood fuel is fed into the elbow joint and fuel is burned in a controlled fashion in the tall combustion cylinder, atop which the pot rests. Variations of this portable stove will be employed throughout West Africa based on local cultural preferences and available fuels.

[15] In line with para 128 b) of "CDM project standard for programmes of activities" Version 02.0



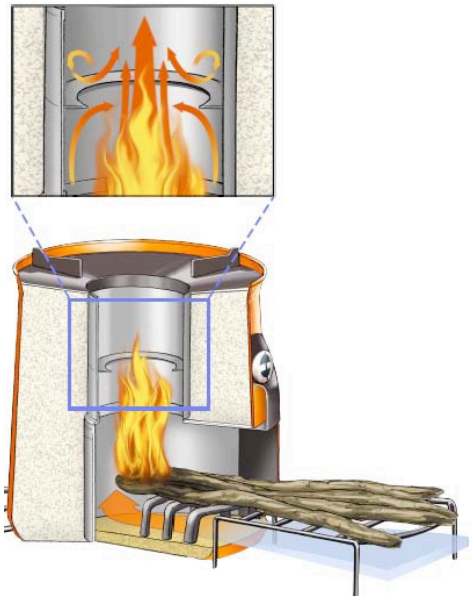
Technical Drawing of the Rocket Stove

Commercial wood stoves that are used to brew millet beer or process shea butter will be disseminated to replace 3-stone open fires. These stationary stoves, commonly known as improved “dolo” stoves, are made out of mud bricks that form a circular “wall” that allows an efficient burning of wood. Improved “dolo” stoves use about 50% less fuel than 3-stone open fires.



Technical Drawing of “dolo” stove

The Envirofit G3300 wood stove is a specific type of rocket stove. A detachable pot skirt replaces the built in pot skirt on many rocket stoves.
Envirofit uses a metal alloy in its combustion chamber that maximizes heat transfer and ensures durability.



Technical Drawing of the Envirofit Stove G3300

(a) The types and levels of services provided by the sytems

Cook stoves under the CPA will provide the similar level of service as the cook stove they are replacing in terms of energy output. However, they will consume less biomass and may be faster, cleaner and produce less smoke (depending on the stove).

(b) Arrangement of the systems

The cookstove will be portable or stationary, on-pot or multi-pot and placed in households and institutions at the place indicated by the end-user.

(c) Range of age and average lifetime

The Toyola type stove has an average lifetime of 5 years based on the monitoring data from CPAs implemented in Togo under this PoA.

The lifetime of stoves will be monitored during the CPA implementation.

(d) Range of efficiencies

The stoves will have a minimum efficiency of 20%. The maximum capacity may vary between 35% and 45% depending on the technology.

(e) Energy and mass flow

Not applicable

(f) Monitoring equipement

Monitoring is typically done through survey and periodic efficiency tests. It is possible that some CPA place monitoring devices on the stoves to track their use.

2. Technologies existing prior to the implementation of the corresponding CPAs

(a) List of systems existing prior to implementation of the CPA

This project will put efficient biomass cook stoves in households, commercial entities and institutions that are currently using inefficient cooking methods. In the case of charcoal stoves, the appliance being replaced will be the traditional metal stove which is most widely used in the host countries for cooking with charcoal or other stoves that are less efficient than the project stoves. In the case of firewood, the baseline will be the 3-stone cooking method or other wood stoves that are less efficient than the project stoves.
The pictures below provide a sample of stoves are that will be replaced.

Traditional metal stove

Traditional Clay stoves

Traditional dolo stove

3-stone fire (source: Servinghandskc)

(b) The types and levels of services provided by the sytems

The existing cook stoves provide the same level service as the stoves to be implemented under the CPA but consume more fuel

(c) Arrangement of the systems

Existing stoves are portable or stationery, one-pot or multi-pot, and placed in the location where end-users cook.

(d) Range of age and average lifetime

The traditional metal stoves are very durable. There are no known industry standard for their lifetime but they can last at least 5 years. Clay stoves are reported by end-users in Togo to have a lifetime of 1 to 2 years. The lifetime of traditional dolo stoves are not known and 3-stone fire last as long as there are stones to prop up a pot.

(e) Range of installed efficiencies

The accepted thermal efficiency of 3-stone fire is 10%. Metal stove and clay stoves have thermal efficiency of 18% and 22.5% respectively, according to studies in CPA 1 implemented in Togo.

(f) Energy and mass flow

Not applicable

(g) Monitoring equipment

Existing stoves do not have monitoring equipment

1. Description of baseline scenario

The baseline scenario is characterized by the use of cooking appliances that waste biomass fuel and by a consumption of non-renewable biomass. The fraction on non-renewable biomass is assessed at the CPA level. The country specific baseline scenario is reassessed at reported in section I.5 of generic PoA a baseline study will be conducted in each of these countries to confirm this fact.

SECTION I. Application of methodologies and standardized baselines

I.1. References to methodologies and standardized baselines

The methodology applied is Small-scale Methodology: Energy efficiency measures in thermal applications of non-renewable biomass --- Version 12.0.

The applied methodology refers to:

“Guideline: General guidelines for SSC CDM methodologies”, “Tool 21: Demonstration of additionality of small-scale project activities” and “Tool19: Demonstration of additionality of microscale project activities”.

The applied methodology also refers to:

(a) Tool 21: Demonstration of additionality of small-scale project activities, version 13.1;

(b) Tool30: Calculation of the fraction of non-renewable biomass, version 3.0;

(c) Tool19: Demonstration of additionality of microscale project activities, version 09.0;

(d) Tool 20: Assessment of debundling for small-scale project activities, version 04;

(e) Standard: Sampling and surveys for CDM project activities and programme of activities, version 09;

(f) Tool 11: Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period, version 3.0.1

I.2. Applicability of methodologies and standardized baselines

Small-scale Methodology: AMS II.G -Energy efficiency measures in thermal applications of non-renewable biomass --- Version 12.0.

<table>
<tr><th>Para</th><th>Methodology requirement</th><th>CPA compliance</th></tr>
<tr><td>2</td><td>This methodology comprises efficiency improvements in thermal applications of non-renewable biomass. Examples of applicable technologies and measures include the introduction of high efficiency biomass fired project devices (cookstoves or ovens or dryers) to replace the existing devices and/or energy efficiency improvements in existing biomass fired cookstoves or ovens or dryers</td><td>Each SSC-CPA will promote biomass stoves that provide efficiency improvements in thermal applications of non-renewable biomass. The CPA will distribute high efficiency cookstoves.</td></tr>
<tr><td>3</td><td>In the case of cookstoves, the methodology is applicable to the introduction of single pot or multi pot portable or in-situ cookstoves with rated efficiency of at least 20 per cent. Refer to the requirements indicated in “Data / Parameter table 14” which details the options for testing and certification as well as supporting documentation (e.g. certificate issued by third party or test results) that needs to be presented to the validating DOE.</td><td>Each SSC-CPA will promote single pot cookstoves that have a minimum efficiency of 20%. CPA will have the choice to present 1) a certification of efficiency provided by a national standards body or an appropriate certifying agent recognized by that body; 2) manufacturer’s specification on efficiency based on WBT that are carried out in accordance with national standards or international standards such as the WBT protocol or ISO 19867-1 listed by the Clean Cooking Alliance.</td></tr>
<tr><td>4</td><td>The aggregate energy savings of a single project activity shall not exceed the equivalent of 60 GWh per year or 180 GWh thermal per year in fuel input.</td><td>Each SSC-CPA will disseminate a number of stoves whose energy savings is equivalent (less than) 180 GWh thermal in energy savings or claim ER from only the number of stoves equivalent to that energy saving will be included under CPA.</td></tr>
<tr><td>5</td><td>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.</td><td>Table: Forested area recorded in Togo between 1990 and 2010 (FAO, 2010) for Togo:
<table>
<tr><th rowspan="3">Country/area</th><th colspan="4">Forest area (1 000 ha)</th><th colspan="6">Annual change rate</th></tr>
<tr><th rowspan="2">1990</th><th rowspan="2">2000</th><th rowspan="2">2005</th><th rowspan="2">2010</th><th colspan="2">1990-2000</th><th colspan="2">2000-2005</th><th colspan="2">2005-2010</th></tr>
<tr><th>1 000 ha/yr</th><th>%[a]</th><th>1 000 ha/yr</th><th>%[a]</th><th>1 000 ha/yr</th><th>%[a]</th></tr>
<tr><td>Togo</td><td>685</td><td>486</td><td>386</td><td>287</td><td>-20</td><td>-3.37</td><td>-20</td><td>-4.50</td><td>-20</td><td>-5.75</td></tr>
</table>

It can be confirmed from above data that Non-renewable biomass has been used in the project region since 31 December 1989.

According to a Ghana’s national report (2017), the rate of deforestation and forest degradation has been on the rise in recent decades. The annual deforestation rose to 794,214 ha per annum between 2013 and 2015.11 Much has been written about deforestation’s causes in Ghana, and it is reported (2019) that Non-renewable biomass such as firewood and charcoal is a key driver of deforestation and negatively impacts climate change, biodiversity, and livelihoods in Ghana[16]. Thus, the above clearly shows that non-renewable biomass has been used in the Ghana since 31 December 1989.

Mali:</td></tr>
</table>

[16] D.Nje et al., Greening The Wood Fuel Sector Of Ghana, (2019)

<table>
<tr><td></td><td></td><td>The FAO data highlight that Mali lost around 1.582.000 ha between 1990 and 2010. With an average annual change rate in the extent of forest of -1.12 for Benin and -0.6 for Mali between 1990 and 2010, we can assume that non-renewable biomass has been used in the project boundary since 31st December 1989.

Table 5: Trends in extent of forest in Mali 1990-2010
<table>
<tr><td>Country</td><td colspan="4">Forest area (1000ha)</td><td colspan="2">Annual change rate (%)</td><td colspan="2">rate</td></tr>
<tr><td>1990</td><td>2000</td><td>2005</td><td>2010</td><td>1990-2000</td><td colspan="2">2000-2005</td><td colspan="2">2005-2010</td></tr>
<tr><td>1000ha/year</td><td>%</td><td>1000ha/year</td><td>%</td><td>1000ha/year</td><td colspan="2">%</td><td colspan="2">%</td></tr>
<tr><td>Mali</td><td>14072</td><td>13281</td><td>12885</td><td>12490</td><td>-79</td><td>-0.58</td><td>-79</td><td>-0.60</td></tr>
</table>

<u>Senegal:</u>
In the period, 1981-2005, it is estimated that between 25,000 hectares and 30,000 hectares of forest were lost annually for the production of charcoal alone (“Country Study: Senegal”, 4th Draft, 2003, page 16, paragraph 2 ; Plan de Convergence pour la Gestion etl’Utilisation Durable des Ecosystemes Forestiers en Afrique de l’Ouest, Rapport Senegal, page 18, table 7). The Global Forest Resources Assessment 201011 (FAO) shows a constant decrease in the forest cover in Senegal in the period 1990-2010, which suggests a continued use of nonrenewable biomass without appropriate re-stocking practices.

<table>
<tr><td></td><td colspan="4">Forest area (1 000 ha)</td><td colspan="6">Annual change rate</td></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td colspan="2">1990-2000</td><td colspan="2">2000-2005</td><td colspan="2">2005-2010</td></tr>
<tr><td>Country/area</td><td>1990</td><td>2000</td><td>2005</td><td>2010</td><td>1 000 ha/yr</td><td>%[a]</td><td>1 000 ha/yr</td><td>%[a]</td><td>1 000 ha/yr</td><td>%[a]</td></tr>
<tr><td>Senegal</td><td>9349</td><td>8898</td><td>8673</td><td>8473</td><td>-45</td><td>-0,49</td><td>-45</td><td>-0,51</td><td>-40</td><td>-0,47</td></tr>
</table>

<u>Burkina Faso</u>
Burkina Faso: According to the FAO[17], during the period between 1990 and 2010, forest cover has declined at an average of 1% per year.</td></tr>
<tr><td>6</td><td>For cases where the biomass is sourced from renewable sources, the project participants should use a corresponding Type I methodology</td><td>Not applicable</td></tr>
<tr><td>7</td><td>The CDM-PDD or CDM-PoA-DD/CPA-DD shall explain the proposed method for distribution of project devices including the method to avoid double counting of emission reductions such as unique identifications of product and end-user locations (e.g. programme logo).</td><td>Each SSC-CPA will sell or donate cookstoves either directly to end users or through intermediaries. Each CPA will explain the distribution method and an identification method (e.g. serial numbering and logo) to avoid double counting.</td></tr>
<tr><td>8</td><td>The CDM-PDD or CDM-PoA-DD/CPA-DD shall also explain how the proposed procedures prevent double counting of emission reductions, for example to avoid that project stove manufacturers,</td><td>A record keeping system and unique identification of the project device will be used. This will include user name, identification number and address/location of the user’s house, stove unique serial code and distribution date. The record keeping system will ensure that each ICS can be</td></tr>
</table>

[17] FAO 2010: EVALUATION DES RESSOURCES FORESTIÈRES MONDIALES 2010 .RAPPORT NATIONAL BURKINA FASO, http://www.fao.org/docrep/013/al468F/al468f.pdf

	wholesale providers or others claim credit for emission reductions from the project devices	traced to one specific CPA to avoid double counting.

Applicability Condition of applied Tools and Standards:

Tool19: Demonstration of additionality of microscale project activities, version 09.0		
Para	**Tool requirement**	**CPA compliance**
2.	This methodological tool provides simplified modalities for demonstrating additionality for the project activity which meets one of the following criteria: (a) Type I: Project activities up to 5 MW that employ renewable energy as their primary technology; (b) Type II: Energy efficiency project activities that aim to achieve energy savings at a scale of no more than 20 GWh per year; or (c) Type III: Other project activities not included in Type I or Type II that aim to achieve GHG emissions reductions at a scale of no more than 20 ktCO2e per year.	The CPA entrails Type II project activities that aim to achieve energy savings at a scale of no more than 20 GWh per year.
3.	This tool covers all technologies/measures that meet the conditions in paragraphs 11-13 below irrespective of the scale of the approved CDM methodology applied to the project activity.	Not applicable. The CPA entrails Type II project activities. The para 11 is not applicable as the CPA does not belong to Type I project activities. Applicable. The CPA entrails Type II project activities. Para 12 is applicable as the CPA entrails microscale project activities with energy savings at a scale of no more than 20 GWh per year. The additionality is based on para 12 (a) and 12 (b.i). The Route 02 additionality demonstration is availed at CPA level following the Tool19: Demonstration of additionality of microscale project activities, version 09.0 Not applicable. The CPA entrails Type II project activities. Para 13 is not applicable as CPA does not belong to Type III project activities.
4	A project activity with more than one component, where each component meets the microscale threshold, is eligible as microscale CDM project activity. The sum of the size of components of a project activity belonging to the same type (i.e. installed capacity for Type I, energy savings for Type II and emission reductions for Type III) shall not exceed the microscale thresholds for the respective type.	The CPA entrails ICS only. The CPA entrails Type II project activities that aim to achieve energy savings at a scale of no more than 20 GWh per year.
5	The tool is not applicable to technologies/measures included in approved methodologies "AMS-III.V: Decrease of coke consumption in blast furnace by installing dust/sludge recycling system in steel works", "AMS-III.P: Recovery and utilization of waste gas in refinery facilities", "AMS-III.Q: Waste Energy Recovery (gas/heat/pressure) Projects" and "AMS-III.W: Methane capture and destruction in non-hydrocarbon mining activities"	The CPA entrails ICS only, and applies AMS II.G -Energy efficiency measures in thermal applications of non-renewable biomass --- Version 12.0.
6	Microscale CDM project activities shall demonstrate that they are not a debundled component of a small-scale (SSC) CDM project activity by applying the criteria in the methodological tool "TOOL20: Assessment of debundling for SSC project activities", for example by	TOOL20 is applied below to demonstrate the requirements of debundling.

	suitably considering microscale thresholds in the place of SSC thresholds (EB 62, para 48). In the case of bundled projects, microscale CDM project activity refers to individual projects within the bundle and requirement under paragraph 103 of the TOOL20 is not applicable.	
Tool 21: Demonstration of additionality of small-scale project activities, version 13.1		
Para	**Tool requirement**	**CPA compliance**
4	The use of the methodological tool "Demonstration of additionality of small-scale project activities" is not mandatory for project participants when proposing new methodologies. Project participants and coordinating/managing entities may propose alternative methods to demonstrate additionality for consideration by the Executive Board.	The CME has provision apply Tool 21: Demonstration of additionality of small-scale project activities, version 13.1 at CPA level under Route 01 of additionality demonstration.
5	Project participants and coordinating/managing entities may also apply "TOOL19: Demonstration of additionality of microscale project activities" as applicable.	The CME has provision apply Tool 19: Demonstration of additionality of microscale project activities, version 09.0; at CPA level under Route 02 of additionality demonstration.
Tool30: Calculation of the fraction of non-renewable biomass, version 3.0		
Para	**Tool requirement**	**CPA compliance**
3	The tool may be used by: (a) DNAs to submit region- or country-specific default f_{NRB} values, following the procedures for development, revision, clarification and update of standardized baselines (SB procedures); or	Applicable, the f_{NRB} values will be determined at CPA level.
	(b) project participants[18] to calculate project- or PoA-specific fNRB values	Applicable, the f_{NRB} values will be determined at CPA level.
Tool 11: Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period, version 3.0.1		
Para	**Tool requirement**	**CPA compliance**
I	This tool provides a stepwise procedure to assess the continued validity of the baseline and to update the baseline at the renewal of a crediting period, as required by paragraph 49 (a) of the modalities and procedures of the clean development mechanism.	The PoA is undergoing the RCP
	The tool consists of two steps. The first step provides an approach to evaluate whether the current baseline is still valid for the next crediting period. The second step provides an approach to update the baseline in case that the current baseline is not valid anymore for the next crediting period.	The CPA will demonstrate the evaluation the current baseline is still valid for the next crediting period and also the approach to update the baseline in case that the current baseline is not valid anymore for the next crediting period
Standard: Sampling and surveys for CDM project activities and programme of activities, version 09;		
Para	**Tool requirement**	**CPA compliance**
2	This standard is applicable to CDM project participants, coordinating/managing entities and designated operational entities (DOEs).	The CME will follow the applicable provisions.
3	This document specifies the reliability requirements and describes appropriate sampling methods and what is expected to be provided in a sampling plan. The general requirements shall be applicable to both small-	The requirements of sampling are included under the CPA sampling requirements at time of renewal of PoA-DD.

[18] In context of this methodological tool, the term project participant also includes coordinating and managing entities for a PoA

	scale and large-scale CDM project activities and PoAs,[19] with any requirements specified in the applied methodologies taking precedence. This document also provides sampling-related requirements pertaining to validation and verification, including the sampling approach to be undertaken by the validating/verifying DOEs. A definition of essential sampling terminology is contained in section 3 below.	
4	This document only addresses random errors associated with sampling and does not address systematic (non-random) errors.	The provisions of the random errors associated with sampling are considered under the generic CPA.
5	The date of entry into force is the date of the publication of the EB 110 meeting report on 27 May 2021.	The sampling requirements are integrated under the CPA sampling requirements at time of renewal of PoA-DD.

No standardized baseline is used.

Each SSC-CPA will remain a Type II project during the entire crediting period as the number of project stoves operating in any given year will not result in energy savings exceeding the small-scale threshold of 180 GWh. For cases that will apply for additionality following the micro scale approach), the threshold limits of micro scale will apply (the limits of microscale is lower than small-scale threshold of 180 GWh

The table below (example) demonstrate how energy savings are calculated for ceramic lined stoves (for which data is available) and the number of stoves that can be operating without exceeding the SSC threshold.

Calculation of $B_{y,\ savings,\ i,\ j}$ and Energy savings	**Value**	**Source**
$B_{old,i,j}$ -annual quantity of woody biomass in baseline (tonnes/year)	5.2	"Update to the Baseline of the PoA "Promoting Efficient Stove Dissemination and Use in West Africa" For Togo" (March 2020) - page 5, table 5. Though Bold is to be updated at the time of CPA inclusion, value is used for demonstrating the sample calculation.
$n_{ew,i,j}$- Average efficiency Toyola Household stove	0.341	Monitored thermal efficiency of stove of age 1 from 2017 WBT report for Togo (page 19). (To be monitored ex-post)
$\eta_{old,i,j}$- Average Efficiency Malgache/Clay Household stove	0.211	"Results of the Stove Test Series Performed for Toyola Energy" (May 2011) -page 12 and "Summary of UEMOA Tests" page 3 (To be fixed at the time of CPA inclusion)
$B_{y,savings,i,j}$-quantity of woody biomass saved per cookstove (tonnes/year)	1.982	Calculated
Leakage adjustment factor	0.95	AMS II G version 12
$B_{y,savings,i,j}$- Adjusted (tonnes/year)	1.883	Calculated
$NCV_{biomass}$ (TJ/tonnes)	0.0156	AMS II G version 12

[19] Afforestation/reforestation (A/R) project activities and A/R PoAs are excluded in the current version

Energy equivalent of $NCV_{biomass}$ (GWh/tonnes)	0.0082	Calculated by multiplying By,savings,i,j with 0.015 with 3.6
CDM SSC limit (GWh/year)	20	Tool 19: Demonstration of additionality of microscale project activities, version 09.0, para 2, sub point b
Energy saved per stove per year	0.0154	Calculated by multiplying 1.883 with 0.0082
Number of stoves that can be operating	1,301	Calculated by dividing 180 GWh by 0.0082

I.3. Application of multiple methodologies

The generic CPA does not apply a combination of multiple methodologies

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

According to the applied methodology AMS II G version 12, the project boundary is the physical, geographical site of the efficient devices that utilize biomass. The project activities all take place in host countries of Togo Burkina Faso, Senegal, Mali and Ghana included in the geographical boundary of the PoA. The locations of all installations included in the CPA will be recorded to prove that they are all within the geographical boundary.

Leakage emissions will be accounted for by multiplying $B_{y,savings,i,j}$ by the adjustment factor of 0.95.

Source		GHG	Included?	Justification/Explanation
Baseline	Combustion of non- renewable biomass for cooking	CO_2	Yes	Main source of emission
		CH_4	No	Not considered as per the methodology. Exclusion is conservative.
		N_2O	No	Not considered as per the methodology. Exclusion is conservative.
	Use and production of charcoal for cooking	CO_2	Yes	Main source of emission
		CH_4	No	Not considered as per the methodology. Exclusion is conservative.
		N_2O	No	Not considered as per the methodology. Exclusion is conservative.
Project activity	Combustion of non- renewable biomass for cooking	CO_2	Yes	Main source of emission
		CH_4	No	Not considered as per the methodology for simplification.
		N_2O	No	Not considered as per the methodology for simplification.

	Use and production of charcoal for cooking	CO_2	Yes	Main source of emission
		CH_4	No	Not considered as per the methodology for simplification.
		N_2O	No	Not considered as per the methodology for simplification.

I.5. Establishment and description of baseline scenario

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Step 1: Assess the validity of the current baseline for the next crediting period	
Step 1.1: Assess compliance of the current baseline with relevant mandatory national and/or sectoral policies	There are no mandatory national or sectoral policies in • Bukrina Faso • Mali • Senegal • Togo • Ghana that prohibit the use of conventional inefficient stoves for cooking. The host countries, continues to experience considerable energy loss for cooking, due to inefficient technologies such as the traditional three-stone fired and similar stoves. There are no relevant mandatory national and/or sectoral policies To be considered for baseline compliance. We, therefore, proceed to Step 1.2
Step 1.2: Assess the impact of circumstances	In this section, we examine the impact of circumstances existing at the time of requesting renewal of the crediting period on the current baseline emissions, without reassessing the baseline scenario. We also assess the availability of new fuels or raw materials in the identification of the current practice for the baseline emissions. Since the registration of the PoA, below circumstances are observed in the host countries Each SSC-CPA will put efficient biomass cook stoves in households, commercial entities and institutions that are currently using conventional inefficient cooking methods. In the case of charcoal stoves, the appliance being replaced will be the traditional metal stove which is most widely used in the host countries for cooking with charcoal or other stoves that are less efficient than the project stoves. In the case of firewood, the baseline will be the 3-stone cooking method or other wood stoves that are less efficient than the project stoves. In Togo, the baseline scenario is the use of the Malgache stove and the clay stove for charcoal consumer and the 3-stone method for firewood consumers[20]. The Malgache and/or the 3-stone also dominate the market in Burkina Faso[21], Mali, Senegal and Ghana among biomass users and are expected to be the baseline stoves for CPA in these countries, however a baseline study will be conducted in each of these countries to confirm this fact. The methodology assumes that in the absence of the project activity, the baseline scenario would be the use of a mix of fossil fuels. The methodology provides default regional values of fossil fuel emission factors. For Sub-Saharan Africa where the SSC-CPA will be implemented, the default emission factor is 73.2 t CO2e/TJ[22]. In accordance with para 277 & 288 of VVS Version 02, baseline scenarios are reassessed below and found there is no change in baseline scenarios in all five countries included in this PoA. **Togo:** Togo's national energy scenario[23] mentions that only 6.7% population has access to clean fuels and technologies for cooking (% of population) till 2016. The studies available on the link also reveals that over 90% of Togolese urban households do not have access to clean cooking. The supply of butane

[20] Enquêtes Consommation des Energies Domestiques au Togo pages 66-67, tables 41 and 42

[21] Etablissement de la Situation de Référence pour la Production et la Diffusion à Grande Echelle des Foyers Améliorés au Burkina Faso- page 19

[22] Tale2. Default regional values of the emission factor of fossil fuels projected to be used to substitute non-renewable woody biomass by similar consumers of applied methodology AMS II.G, version 12

[23] https://www.se4all-africa.org/seforall-in-africa/country-data/togo/

	gas channels are not sufficiently decentralized and the gas price and the purchase cost of user equipment significantly limit the access of the majority of the population to modern cooking fuel. Therefore, it is concluded that the baseline scenario remained unchanged during the renew of crediting period of this programme. **Ghana:** Ghana's national energy scenario[24] mentions that only 21.7% population has access to clean fuels and technologies for cooking (% of population) till 2016. Report available on the link[25] *'Several programmes have been undertaken over the years to create awareness on the availability of improved cook stoves, and to facilitate the distribution of modern cooking appliances and fuels with positive health implications. The CME also confirms that* [26] Primary household cooking fuel (percentage of households) has share of 22.3 % towards LPG, 41.3 % from wood, 31.5 % from charcoal, 0.4 % from crop residue, 0.2 % from kerosene and 0.1 % from electricity (reference – Chapter 4, Table 4. Primary household cooking fuel (percentage of households, page 7). *A number of initiatives have also been undertaken under the National LPG Promotion Programme to encourage the use of LPG for cooking'* however these programmes are voluntary and doesn't mandate the households to use ICS for cooking. Hence, though a government objective has been defined, it is not guaranteed whether this objective will be achieved in reality and if so, to what extent. Therefore, it is concluded that baseline scenario in Ghana is also unchanged at the time of RCP. **Mali:** Mali's national energy scenario [27] mentions that only 1% population has Access to clean fuels and technologies for cooking (% of population) till 2016. The link also reveals that the country set a 87% access target to be reached by 2030 for electricity (110% in urban areas, 81% in rural areas) and 100% for clean cooking solution, while further improving the share of renewable energy sources in the electricity mix to 37%. Energy efficiency goal is to achieve a primary energy intensity of 0,43 (ktoe / GDP) by 2030. Hence, though a government objective has been defined, it is not guaranteed whether this objective will be achieved in reality and if so, to what extent. Therefore, it is concluded that baseline scenario in Mali is also unchanged at the time of RCP. **Senegal** Senegal's national energy scenario[28] mentions that only 31.7% population has access to clean fuels and technologies for cooking (% of population) till 2016. Therefore, it is concluded that baseline scenario in Senegal is also unchanged at the time of RCP as majority of population ~68% does not have access to clean energy.

[24] https://www.se4all-africa.org/seforall-in-africa/country-data/ghana/

[25] https://www.se4all-africa.org/fileadmin/uploads/se4all/Documents/Country_AAs/GhanaSustainable_Energy_For_All_Action_Agenda.pdf

[26] http://apps.who.int/iris/bitstream/handle/10665/274281/9789241514026-eng.pdf?sequence=1&isAllowed=y - Opportunities for transition to clean household energy Application of the WHO Household Energy Assessment Rapid Tool (HEART) issued by WHO, 2018

[27] https://www.se4all-africa.org/seforall-in-africa/country-data/mali/

[28] https://www.se4all-africa.org/seforall-in-africa/country-data/senegal/

	Burkina Faso: Burkina Faso's national energy scenario[29] mentions that only 8.9% population has access to clean fuels and technologies for cooking (% of population) till 2016. Therefore, it is concluded that baseline scenario in Senegal is also unchanged at the time of RCP as majority of population ~91% does not have access to clean energy. The link also reveals that "*The country is an ECOWAS member and, with the rest of the region, adopted a concerted approach to the implementation of the SE for All Country Action, with the development of the Action Agenda alongside the Renewable Energy and Energy Efficiency Action Plans, and their formal adoption. The Objectives envisaged by the government are to reach a global 95% electricity access (50% in rural areas) and universal access to clean cooking solution in urban areas (65% in rural areas) by 2030. The Government also set a target of 50% Renewable Energy in the electric mix by 2030 (without biomass)".* It is therefore demonstrated that the new circumstances do not make a continued validity of the current baseline not plausible, hence the current baseline does not need to be updated for the subsequent crediting period. Thus in line with the applied methodology, it is assumed that in the absence of the project activity, the baseline scenario would be the projected use of fossil fuels to meet similar thermal energy needs as those provided by the project devices. We, therefore, proceed to Step 1.3
Step 1.3: Assess whether the continuation of use of current baseline equipment(s) or an investment is the most likely scenario for the crediting period for which renewal is requested.	This sub-step is to be applied only if the baseline scenario identified at the validation of the project activity was the continuation of use of the current equipment(s) without any investment and, the projects proponents or third party (or parties) would undertake an investment later due, for example, to the end of the technical lifetime of the equipment(s) before the end of the crediting period or the availability of a new technology. The baseline scenario identified at the time of validation of project activity was the continued use of woody biomass/ charcoal in the inefficient stoves without any investment. There were no plans to undertake any investment towards the end of the technical lifetime of the equipment before the end of the project's crediting period or due to availability of a new technology. This sub-step also requires to assess whether the remaining technical lifetime of the equipment that would have continued to be used in the absence of the project activity, as determined in the CDM-PDD, exceeds the crediting period for which renewal is requested. The identified baseline at time of registration i.e. inefficient stoves using woody biomass/ charcoal would have been continued to be operated in the absence of the project activity. The inefficient stove is rudimentary system. This has no set lifetime and can be easily replaced with similar inefficient stove. As mentioned in the previous step, there has not been penetration of improved cookstoves or LPG based stoves. The host countries are on the mission to promote transition from wood/ charcoal fuel to environmentally friendly fuels for cooking, but the policy approach and its implementation still remain impracticable, largely due to poverty and weak policies and poor last mile energy delivery infrastructure. households, commercial entities and institutions energy demand is known to be mostly guided by prices of fuels and appliances, disposable income of households, availability of fuels and appliances, and cultural preferences. When there is scarcity of cooking gas, which

[29] https://www.se4all-africa.org/seforall-in-africa/country-data/burkina-faso/

<table>
<tr><td></td><td>happens frequently, the shift is usually towards solid biomass for cooking.

Therefore, the continuation of use of current baseline equipment is likely during the crediting period. The most plausible baseline scenario is hence that firewood/woody biomass/ charcoal from non-renewable sources.

Hence, as per the methodology provisions, it is assumed that in the absence of the PoA, the baseline scenario would be the projected use of fossil fuels for meeting similar thermal energy needs. Therefore, emission reductions are calculated by multiplying the thermal energy from annual biomass savings stemming from non-renewable biomass ($B_{y,savings,i,j}$) with an emission factor for fossil fuels. The baseline emission factor for fossil fuels is 73.2 tCO_2/TJ as per par. 25 of AMS-II.G. ver. 12.

The baseline scenario of the project activity is therefore the continuation of use of the current equipment(s) without any investment and the projects proponents or third party(ies) did not plan to undertake any investment later, before the end of a crediting period, therefore the current baseline does not need to be updated for that crediting period or the crediting of emission reductions is not required to be limited to the period before the baseline equipment would cease its operation. In addition there are no mandatory requirements to use clean fuel in the country i.e. there is no restriction on continued use of solid fuels like woody biomass that is used widely and freely available.
Hence we move to step 1.4</td></tr>
<tr><td>Step 1.4: Assessment of the validity of the data and parameters</td><td>This sub-step requires to assess whether data and parameters that were only determined at the start of the crediting period and not monitored during the crediting period are still valid or whether they should be updated.

Updates are required to be undertaken in the following cases:

• Where IPCC default values are used, the values should be updated if any new default values have been adopted and published by the IPCC, for example, in guidelines for national GHG inventories, IPCC assessment report or special reports by the IPCC;

• Where emission factors, values or emission benchmarks are used and determined only once for the crediting period, they should be updated, except if the emission factors, values or emission benchmarks are based on the historical situation at the site of the project activity prior to the implementation of the project and cannot be updated because the historical situation does not exist anymore as a result of the CDM project activity.

The parameters that were determined at the start of the crediting period are still valid, however they require to be updated i.e. the data/value of these parameters needs update.

The following data and parameters that were only determined at the start of the crediting period and not monitored during the crediting period have been updated:

$f_{NRB,y}$: Fraction of non-renewable biomass : The value will be calculated on per CPA basis

$EF_{projected\_fossilfuel}$: Emission factor for fossil fuels

B_{old}: Annual quantity of woody biomass that would have been used in the absence of the project activity

Below is a comparison of the values that have been updated:
<table>
<tr><td>Parameter</td><td>1st crediting period</td><td>2nd crediting period</td></tr>
<tr><td>$f_{NRB,y}$ (Fraction)</td><td>For CPAs in Togo: 0.97</td><td>Calculated at CPA level</td></tr>
<tr><td>$EF_{projected\_fossilfuel}$ (tCO2/TJ)</td><td>81.6</td><td>73.2</td></tr>
</table>
</td></tr>
</table>

	$B_{old,i,j}$ (tons/HH/year)	Togo Household stoves: 0.866 tonnes Commercial stoves: 1.23 tonnes	To be identified at CPA Level
Step 2: Update the current baseline and the data and parameters			
Step 2.1: Update the current baseline	As per the analysis during step 1, the baseline is still valid. However, there are parameters that needs to be updated which have been updated as per step 2.2 below.		
Step 2.2: Update the data and parameters	As per this step, if the application of Step 1.4 showed that the data and/or parameter(s) that were only determined at the start of the crediting period and not monitored during the crediting period are not valid anymore, project participants should update all applicable data and parameters. Hence as per this step, CME has updated the below parameters: • $f_{NRB,y}$: Fraction of non-renewable biomass : The value will be calculated on per CPA basis following the tool 30. • $EF_{projected\_fossilfuel}$: Emission factor for fossil fuels • $B_{old,i,j}$: Annual quantity of woody biomass that would have been used in the absence of the project activity		

I.6. Estimation of emission reductions

I.6.1. Explanation of methodological choices

According to the applied methodology, emission reductions are calculated using the equations below. Baseline and project emissions are not calculated separately.

Equation 1

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

Where:

i	=	Indices for the situation where more than one type of project device is introduced to replace the pre-project devices[30]
j	=	Indices for the situation where there is more than one batch of project device
ER_y	=	Emission reductions during year y (tCO_2e)
$ER_{y,i,j}$	=	Emission reductions by project device of type i and batch j during year y (tCO_2e)
LE_y	=	Leakage emissions in the year y (tCO_2e)

[30] For example, in some instances, full replacement of the pre-project device would require the implementation of more than one project device (e.g. one stove suitable for cooking and the other stove suitable for cooking/boiling water).

Equation 2

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

Where:

$B_{y,savings,i,j}$	=	Quantity of woody biomass that is saved per cookstove device of type *i* and batch *j* during year *y* (tonnes)
$f_{NRB,y}$	=	Fraction of woody biomass that can be established as non-renewable biomass[31] (fraction or %)
$NCV_{biomass}$	=	Net calorific value of the non-renewable woody biomass that is substituted (IPCC default for wood fuel, 0.0156 TJ/tonne, based on the gross weight of the wood that is 'air-dried')
$EF_{projected\_fossilfuel}$	=	Emission factor of fossil fuels projected to be used to substitute non-renewable woody biomass by similar consumers (tCO_2e/TJ).
$N_{0,i,j}$	=	Number[32] of project devices of type *i* and batch *j* commissioned (number)
$n_{y,i,j}$	=	Proportion of commissioned project devices of type *i* and batch *j* ($N_{0,i,j}$) that remain operating in year *y* (fraction)
μ_y	=	Adjustment to account for any continued use of pre-project devices during the year *y*

Project participants have the option to use the default regional value for fossil fuel emission factor or to estimate the emission factor. SSC- CPA will use the default emission factor for Sub-Saharan Africa which is 73.2 t CO_2e/TJ.

The applied methodology also provides project participants the option to calculate $B_{y,savings,i,j}$ in different ways. CME has opted Option 3 in line with the applied methodology AMSIIG, version 12:

Option 2: Kitchen performance test (KPT)

Equation 6

Where:

	=	Annual quantity of woody biomass that would have been used in the absence of the project activity to generate thermal energy equivalent to that provided by the project device type *i* and batch *j* (tonnes/year)
	=	Annual quantity of woody biomass used in tonnes per project device of type *i* and batch *j*, measured as per the KPT protocol (tonnes/year)

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

[32] Project devices may be commissioned in batches. See paragraph **Error! Reference source not found.**.

Option 2: kitchen performance test (KPT):
Equation (6)

$B_{y,savings,i,j} = B_{old,i,j} - B_{new,KPT,i,j}$
(for CPAs applying KPT approach)

Option 3: water boiling test (WBT) (for CPAs applying WBT approach)

Equation 7

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

Charcoal to woody biomass conversion
CPA that disseminate charcoal stoves will use the conversation factor of 6 kg of firewood per 1 kg of charcoal unless there are credible local conversation factors determined from a field study or literature, as per paragraph 35 of the applied methodology.

Leakage
CPA will apply an adjustment factor of 0.95 to $B_{y,savings,i,j}$ to account for leakage

Replacement of firewood baseline stoves with charcoal project stoves
In cases efficient charcoal stoves in the project scenario replace baseline stoves that use firewood, the CPA will account for leakage effect related to production of charcoal by using the default value of 0.030 t CH4/t charcoal. Equation 12 and 13 below will be used to calculate this leakage. The GHG emission caused by this switch will be deducted from the total emission reduction per monitoring period.

Equation 12

$E_{additional} = B_{y,charcoal} \times EF_{CH4} \times GWP_{CH4}$

Where:

$E_{additional}$	= Additional emissions resulting from the switch from wood to charcoal
$B_{y,charcoal}$	= annual quantity of charcoal used by households during the project activity
EF_{CH4}	= The emission factor of methane during charcoal production given as 0.030 tCH4/t charcoal by AMS.II.G. version 12, para 43
GWP_{CH4}	= The Global Warming Potential of methane given by the IPCC as 25[33]

Equation # 13

$B_{y,charcoal} = B_{old,charcoal} - B_{y,savings-charcoal}$

[33] http://www.ipcc.ch/publications_and_data/ar4/wg1/en/ch2s2-10-2.html (visited May 27, 2014)

Where:

$B_{y,charcoal}$ = annual quantity of charcoal used during the project activity

$B_{old,charcoal}$ = quantity of charcoal used in the absence of the project activity in the area where the replacement has occurred

$B_{y,savings\text{-}charcoal}$ = quantity of charcoal saved by the project stove

I.6.2. Data and parameters fixed ex ante

Data/Parameter	$EF_{projected-fossil\ fuel}$
Data unit	tCO_2e/TJ
Description	Emission factor of fossil fuels projected to be used to substitute non-renewable woody biomass by similar consumers
Source of data	AMS II G version 12
Value(s) applied	73.2
Choice of data or Measurement methods and procedures	Default value provided by applied methodology for Sub-Saharan Africa
Purpose of data	Calculation of emission reductions
Additional comment	N/A

Data/Parameter	$B_{old,p}$
Data unit	tonnes/person/year
Description	Annual quantity of woody biomass that would have been used per person in the household in the absence of the project activity to generate thermal energy equivalent to that provided by the project devices
Source of data	Baseline surveys, default value, historical data or standardised baseline if available
Value(s) applied	Each CPA will determine prior to inclusion in the PoA
Choice of data or Measurement methods and procedures	CPA will have the option to conduct a survey, use default values provided by the applied methodology, standardized baseline or historical data. For surveys, the latest version of the guideline and standard for "sampling and surveys for CDM project activities and programmes of activities" will be used.
Purpose of data	Calculation of emission reductions
Additional comment	In case of any restrictions that does not allow to determine this parameter (example pandemic, emergency situations etc), then A default value of 0.5 tonnes/capita per year[34]. This option will be limited to household project devices (not eligible for oven and dryers). If project proponents opt to use the default value for insitutions (e.g. schools, prisons), the value will be adjusted, based on the number of meals cooked[35]. Country or region-specific values approved through the "procedure for development, revision, clarification and update of standardized baselines," which are available on the CDM website http://cdm.unfccc.int/methodologies/standard_base/index.html may also be availed in case surveys cannot be conducted.

[34] Refer to "Annex 5 - Information note on the rationale for default factors used in AMS-I.E. and AMS-II.G." of the SSC WG 42 meeting report.

[35] For example, in case of day schools, only one meal may be prepared by schools and provided to students and staff, except during school holidays when the use of fuel may not be significant.

Data/Parameter	$\eta_{old,i,j}$
Data unit	fraction
Description	Efficiency of pre-project device
Source of data	Report of WBT or default value
Value(s) applied	CPA using this option will determine value prior to inclusion in the POA
Choice of data or Measurement methods and procedures	The parameter may be established based on a representative sample survey of the pre-project devices and fixed ex ante (i.e. there is no need to determine baseline efficiency for each individual household when including in the project activity database). The survey is to be conducted in line with the "Standard for sampling and surveys for CDM project activities and programmes of activities". The representative sampling survey may ask whether the pre-project device is a traditional three-stone fire or another conventional device with no improved combustion air supply or flue gas ventilation. In that case, it is possible not to conduct efficiency tests and to use the following default efficiency values to calculate the weighted average. . 0.1 for a three-stone fire using firewood (not charcoal), or a conventional device with no improved combustion air supply or flue gas ventilation, that is without a grate or a chimney; . 0.2 for other types of devices. Furthermore, CPAs conservatively assume that the efficiency of all pre-project devices is 0.2 in which case there is no need to conduct a survey to determine the weighted average efficiency referred above.
Purpose of data	Calculation of emission reductions

Data/Parameter	$N_{p,HH}$
Data unit	Number
Description	Average number of persons served per household prior to project implementation
Source of data	Surveys or national data
Value(s) applied	Each CPA will determine prior to inclusion in the PoA
Choice of data or Measurement methods and procedures	CPA will conduct surveys or use national data. For surveys, the latest version of the guideline and standard for "Sampling and surveys for CDM project activities and programmes of activities" will be used.
Purpose of data	Calculation of emission reductions
Additional comment	N/A

Data/Parameter	$B_{old,HH}$
Data unit	tonnes/household/year
Description	Annual quantity of woody biomass that would have been used in the household in the absence of the project activity to generate thermal energy equivalent to that provided by the project devices
Source of data	Surveys or national data
Value(s) applied	Each CPA will determine prior to inclusion in the PoA
Choice of data or Measurement methods and procedures	CPA will use the following two options: 1. $B_{old,p}$ times $N_{p,HH}$ or; 2. Based on the historical data or a sample survey conducted as per the latest version of "Sampling and surveys for CDM project activities and programmes of activities". If the monitoring period is shorter or longer than one year, the result may be extrapolated for the monitoring period or Values used in other schemes (e.g. registered Gold Standard carbon offset projects) from the same region will be considered as acceptable when it is demonstrated to be suitable for use as per the procedures indicated in the general guidelines as stated under "Additional comment"
Purpose of data	Calculation of emission reductions
Additional comment	The value may be derived, based on the historical data or a sample survey conducted as per the latest version of "Sampling and surveys for CDM project activities and programmes of activities". Paragraph 23 of "General guidelines for SSC CDM methodologies (version 22.1)" by applying guidance on the use of data including historic data to derive parameter values. Values used in other schemes (e.g. registered Gold Standard carbon offset projects) from the same region are acceptable when it is demonstrated to be suitable for use as per the procedures indicated in the above general guidelines CPAs that disseminates charcoal project stoves determine the charcoal consumption per household then convert it to woody biomass using the conversion factor of 6 kg of firewood for 1 kg of charcoal. Alternatively, credible local conversion factors determined from a field study or literature may be applied.

Data/Parameter	$C_{C,W}$
Data unit	kg wood / kg Charcoal
Description	The conversion factor from charcoal to wood
Source of data	Default value as per applied methodology AMS-II.G version 12
Value(s) applied	6
Choice of data or Measurement methods and procedures	Default value as per para 35 of AMS II.G Version 12, https://www.ipcc-nggip.iges.or.jp/public/gl/guidelin/ch1ref3.pdf, Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories: Reference Manual, section 1.4.3 Biomass Data, page 1.45
Purpose of data	Calculation of baseline emissions
Additional comment	The value is fixed ex-ante

Data/Parameter	$B_{old,i,j}$
Data unit	Tonnes/year
Description	Annual quantity of woody biomass that would have been used in the absence of the project activity to generate thermal energy equivalent to that provided by the project device type *i* and batch *j*
Source of data	Calculated
Value(s) applied	Each CPA will determine prior to inclusion in the PoA
Choice of data or Measurement methods and procedures	$B_{old,HH}$ divided by $N_{d,HH}$
Purpose of data	Calculation of emission reductions
Additional comment	$B_{old,i,j}$ equals $B_{old,HH}$ when only one project device per household is distributed.

Data/Parameter	f_{NRB}
Data unit	Fraction or %
Description	Fraction of woody biomass saved by the project activity during year *y* that can be established as non-renewable biomass
Source of data	Latest version of Tool 30 i.e. Calculation of the fraction of non-renewable biomass or valid default value provided by DNA oh host country.
Value(s) applied	Each CPA will determine prior to inclusion in the PoA
Choice of data or Measurement methods and procedures	CPA will use UNFCCC default values (valid at the time of CPA inclusion) when available, otherwise, latest version of "TOOL30: Calculation of the fraction of non-renewable biomass" will be used
Purpose of data	Calculation of emission reductions
Additional comment	N/A

Data/Parameter	LAF
Data unit	Fraction
Description	Net to gross adjustment factor for $B_{y,savings,i,j}$
Source of data	AMS.II.G Version 12
Value(s) applied	0.95
Choice of data or Measurement methods and procedures	Default value as prescribed by methodology applied
Purpose of data	Calculation of baseline emissions
Additional comment	CPA will apply an adjustment factor of 0.95 to $B_{y,savings,i,j}$ to account for leakage

Data/Parameter	Life Span
Data unit	Number of years
Description	The operating life time of the project device.
Source of data	Monitoring surveys or Manufacturer (certified by a national standards body or an appropriate certifying agent recognized by that body)
Value(s) applied	To be determined at CPA level
Measurement methods and procedures	Manufacturer (certified by a national standards body or an appropriate certifying agent recognized by that body)
Monitoring frequency	Fixed and recorded at the time of commissioning/distribution
QA/QC procedures	Manufacturer (certified by a national standards body or an appropriate certifying agent recognized by that body)
Purpose of data	Calculation of emission reduction
Additional comment	This parameter ex-ante applicable to only those CPAs only, which will opt linear depreciation method in accordance with para 37 (a-d) & Option 3: water boiling test (WBT) (as specified in paragraph 32).

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

Ex ante emission reductions are calculated using the equations outlined in section I.6.1 above.
The following steps are followed in the calculation:

$ER_y = B_{y,saving,i,j} \times N_{y,i,i} \times f_{NRB,y} \times NCV_{biomass} \times EF_{projected\_fossilfuel}$

Where,

$B_{y,saving,i,j}$ = Quantity of woody biomass that is saved in tonnes per cook stove device of type *i* during year *y*

$N_{y,i,j}$ = Number of project devices of type *i* operating during year *y*

$f_{NRB,y}$ = Fraction of woody biomass that being established as non- renewable biomass using survey methods (85.2%)

$NCV_{biomass}$ = Net calorific value of the non-renewable woody biomass that is substituted (IPCC default for wood fuel, 0.0156 TJ/tonne, based on the gross weight of the wood that is 'air-dried')

$EF_{projected\_fossilfuel}$ = Emission factor for the fossil fuels projected to be used for substitution of non-renewable woody biomass by similar consumers. Default value of 73.2 t CO_2/TJ for Sub-Saharan Africa

Further,

$B_{y,saving,i,j} = B_{old,i,j} \times L_y \times [1- (\eta_{old,i,j}/\eta_{new,i,j})]$ (**Example for the CPAs applying option 3)**

Where,

$B_{old,i,j}$ = Annual quantity of woody biomass that would have been used in the absence of the project activity to generate useful thermal energy equivalent to that provided by the project device type *i (Tonne/year)*

L_Y = is the leakage adjustment factor or 0.95 (as per default value) of AMS-II.G version 12

$\eta_{new,i,j}$ = Efficiency of the project device*i* *(*assumption 50%*)*

$\eta_{old,i,j}$ = Efficiency of the old devices being replaced by project devices of type *i* (20%)

$B_{old,i,j} = B_{old,c,HH} \times 6$

Where,

$B_{old,c,HH}$ = Annual quantity of charcoal that would have been used in the household in the absence of the project activity to generate useful thermal energy equivalent to that provided by the project devices (assumption 0.969 tonnes/household/year)

Hence,
$B_{old,i,j}$ = $B_{old,c,HH}$ x 6 = 0.969 (assumption) x 6 = 5.81 tonne/year

For example, considering one IC stove per household, the number of IC stoves 50000 (assumption) the saving is calculated as

$B_{y,saving,i,j}$ = 5.81 x 0.95 x [1- (20%/50%)]

$B_{y,saving,i,j}$ =3.314 tonne wood/per year/per stove

Hence
ER_y = 3.314x 1,301 x 0.0156 x 73.2 x 0.852

ER_y = 4,194 tCO_2e/year (rounded down)

I.7. Monitoring plan

I.7.1. Data and parameters to be monitored

Data/Parameter	$N_{0,i,j}$
Data unit	Number
Description	Number of commissioned project devices of type *i* and batch *j*
Source of data	Monitoring
Value(s) applied	To be determined at CPA level
Measurement methods and procedures	As per paragraph **Error! Reference source not found.** of methodology
Monitoring frequency	At least once every two years
QA/QC procedures	-
Purpose of data	Calculation of baseline emission
Additional comment	-

Data/Parameter	Ny,i,j
Data unit	Number
Description	Number of project devices of type I and batch j operating during year y
Source of data	ICS distribution database and Survey records
Value(s) applied	To be determined at CPA level
Measurement methods and procedures	Measured directly based on a representative sample. Sampling standard shall be used for determining the sample size to achieve 90/10 confidence/precision levels. Separate samples shall be taken for each batch. If the survey efforts combine two or more CPA, the confidence/precision levels shall be 90/10, however in case micro scale CPA/s is involved in any batch, then the confidence/precision levels shall be followed 95/10 conservatively. A discount shall be applied based on the percentage of devices operational as determined by the sample survey, e.g. if survey shows that 10% of the devices is non-operating, an adjustment factor of 0.9 shall be applied to number of project devices commissioned in a particular batch. Separate samples shall be taken for each batch. Sampling Frame: Project Database of each CPA (or combined PoA database in case of PoA level sampling) as defined by distribution date, appliance type, serial number, and end-user information. The number of stoves still operating will be determined based on representative sampling. The total number of operational stoves shall be calculated as the fraction of stoves of type i and age a found operational in the sampling survey multiplied by total number of stoves of type I and age a in the project database.
Monitoring frequency	At least once every two years
QA/QC procedures	For each CPA, CME and or CPA implementer (if different than CME) shall maintain a distribution record to calculate this parameter. The CME supervises the activities of each CPA implementer (when not the CME itself), and provides training, guidelines and templates to facilitate accurate testing and record keeping. In the case the desired precision is not met, lower bound values shall be used against repeating the survey to determine the operational fraction of stoves of type i and age a.
Purpose of data	Calculation of baseline emission

Additional comment	All data sources will be transparent and verifiable.

Data/Parameter	$n_{y,i,j}$
Data unit	fraction
Description	Proportion of commissioned project devices of type *i* and batch *j* ($N_{0,i,j}$) that remain operating in year *y* (fraction)
Source of data	Monitoring survey reports
Value(s) applied	To be determined at CPA level
Measurement methods and procedures	Measured directly based on a representative sample. Sampling standard shall be used for determining the sample size to achieve 90/10 confidence/precision levels. Separate samples shall be taken for each batch. If the survey efforts combine two or more CPA, the confidence/precision levels shall be 90/10, however in case micro scale CPA/s is involved in any batch, then the confidence/precision levels shall be followed 95/10 conservatively. In the case the desired precision is not met, lower bound values shall be used against repeating the survey to determine the operational fraction of stoves of type *I* and age a.
Monitoring frequency	At least once every two years (biennial)
QA/QC procedures	Surveys are conducted by third party or in house by the CME. This 3rd party/CME will have QA/QC procedures for checking data.
Purpose of data	Calculation of emission reduction
Additional comment	N/A

Data/Parameter	$n_{old,i,j}$
Data unit	fraction
Description	Efficiency of the baseline device
Source of data	ICS distribution records
Value(s) applied	0.1 or 0.2
Measurement methods and procedures	0.1 In case of a three-stone fire using firewood (not charcoal), or a conventional device with no improved combustion air supply or flue gas ventilation, that is without a grate or a chimney; 0.2 for other types of baseline devices
Monitoring frequency	Once at the time of stove distribution
QA/QC procedures	Not applicable
Purpose of data	Calculation of emission reduction
Additional comment	Apply the conservative value if more than one type of stove is replaced

Data/Parameter	μ_y
Data unit	fraction
Description	Adjustment to account for any continued use of pre-project devices during the year *y*
Source of data	Monitoring survey reports
Value(s) applied	To be determined at CPA level
Measurement methods and procedures	CPA will have the option to use of the following methods: Option 2, page 19 of AMS II.G., version 12 is used to determine μ_y. The sampled users will be checked for presence of baseline stove and if it is used along with project stove for cooking. For samples where baseline stove is found not being used μ_y = 1.0 . For samples where the baseline stove is found to be in use, μ_y shall be determined as: • ratio of frequency of usage (i.e. number of meals cooked on ICS Vs Total number of meals cooked on ICS and baseline stove) For example, if there were 3 pre-project devices per household and it was determined during the survey that use of one of them continues during the crediting period then a conservative adjustment factor of 0.66 is applied for the relevant monitoring period. Another example would be the case where there was only one pre-project device per household and its use during the project period continues along with the project stove to meet 25% of the cooking needs of the household in which case the adjustment factor will be 0.75. Where a more precise data is available, i.e. the thermal capacity of the project and pre-project devices and respective utilization hours, a weighted average adjustment factor may be used The confidence/precision levels shall be 95/10: • Monitoring frequency is biennial • CPA(s) solely comprise of Micro Scale units or involve any micro scale CPA in the given batch Sampling standard shall be used for determining the sample size to achieve 90/10 confidence/precision levels. Separate samples shall be taken for each batch, however in case micro scale CPA/s is involved in any batch, then the confidence/precision levels shall be followed 95/10 conservatively. In the case the desired precision is not met, lower bound values shall be used instead of repeating the survey

Monitoring frequency	At least once every two years (biennial)
QA/QC procedures	Surveys will be conducted by a 3rd party or by CME.
Purpose of data	Calculation of emission reduction
Additional comment	N/A

Data/Parameter	$\eta_{new,i,j}$
Data unit	Fraction
Description	Efficiency of the device of each type *i and* batch *j* implemented as part of the project activity
Source of data	Water Boiling Test reports
Value(s) applied	To be determined at CPA level
Measurement methods and procedures	Efficiency shall be measured/estimated as per the following: 1. The efficiency of the project devices shall be based on certification by a national standards body or an appropriate certifying agent recognized by that body. 2. Alternatively, manufacturer specifications on efficiency based on water boiling test (WBT) may be used. The WBT shall be carried out in accordance with national standards (if available) or international standards or guidelines (e.g. the WBT Protocol36,37 or ISO 19867-1 listed by Clean Cooking Alliance (See https://www.cleancookingalliance.org/technology-and-fuels/testing/protocols.html)). For 1 and 2 above, the sampling test of stoves by such certification bodies/agents or manufacturers shall be conducted following a 90/10 precision in accordance with the "Standard for sampling and surveys for CDM project activities and programme of activities". 3. However, the following simplified approach may be used, when the efficient cookstoves are produced by a manufacturer with a recognized management system in place (e.g. ISO certification) to ensure that the individual equipment produced do not vary beyond the range of acceptance limits (e.g. characteristics such as materials, critical dimensions): (i) Conduct a sample test on three cookstoves with three tests conducted for each stove. The test can be carried out by project proponents by themselves or stove manufacturers; (ii) If the standard deviation of the nine test results indicated above is very small and 90/10 precision requirement is met (in this case, the value of the t-distribution for 90 per cent confidence shall be used instead of Z value), the efficiency determined is acceptable, otherwise more sample tests would be required until 90/10 precision is met. 4. For project activities that implement cookstoves with saucepan capacities both greater than 30 L as well as smaller than 30 L, the most conservative value among the results of efficiency tests conducted (i.e. the least efficiency determined) on cookstoves of sizes equal to or smaller than 30 L may be used for stoves that are larger than 30 L in lieu of actual testing of the efficiency of stoves that are above 30 L capacity. The simplified approach above may also be used to comply

PPs/CMEs may conduct only the first two phases of the stove tests: cold-start high-power phase and hot-start high-power phase (not including the simmer phase) for calculation of the high-power thermal efficiency.

[37] The guidance provided in the WBT protocol may be followed for calibration of testing equipment.

	with eligibility requirements under paragraph 0 and can be used only if the following conditions are met: (i) Stoves that can hold saucepans that are larger than 30 L are from the same manufacturer[38] and of similar design (e.g. with respect to construction materials including insulation material, placement of grate, cooking vessels and if applicable chimney) as compared to the stoves that are smaller than 30 L; (ii) Project proponents should demonstrate that comparable repair and maintenance practices are undertaken on all project stoves, irrespective of the size
Monitoring frequency	The provision of para 37 of applied methodology apply. As per para 37 *"the Project participant may choose any of the options below to account for the loss in efficiency (Option 3)" "the option should be identified and fixed ex ante for the entire crediting period in the PDD at the time of registration"* Thus, any of the below stated provision as per para 37 will be chosen explicitly at time of the CPA inclusion (a) A default schedule of linear decrease in efficiency up to the terminal efficiency assumed as 20 per cent shall be applied through the life span of the project device[39]; or (b) Manufacturer of project devices shall confirm with technical justification based on certification by a national standards body or an appropriate certifying agent recognized by that body that no decrease in efficiency of project device is envisaged during the crediting period; or (c) Determine[40] the rate of efficiency drop for a representative sample of the first batch of project device *i* in year *y* and assume that same rate of loss in efficiency applies to all other batches. In other words, it may be assumed that the degradation of efficiency measured in a representative sample of the first batch of project devices i apply to all subsequent batches. The efficiency of the project devices in the first batch has to be monitored annually through representative samples and this rate of loss in efficiency may be applied correspondingly to all batches; (d) Determine the loss in efficiency annually from a representative sample of each batch and use the actual loss rate that is measured. CPA will indicate which option they chose at the time of inclusion
QA/QC procedures	WBT will be conducted by a 3rd party
Purpose of data	Calculation of emission reduction
Additional comment	This parameter applied to CPA that use Option 3: water boiling test for determining $B_{y,savings}$

[38] For in-situ constructed stoves, show that the prefabricated components are sourced from the same supplier.

[39] If the efficiency of the project devices falls below 20%, it is no longer eligible to be considered a project device.

[40] Example: For the representative sample of Batch 1, if the efficiency of a new project device is 30% and at the end of Year 1, the efficiency is monitored to be 29%; the loss rate is (30%-29%)/1=1%. Then this 1% loss rate is to be assumed to be applicable for all the devices in the first batch and subsequent batches for first year of operation.

Data/Parameter	$NCV_{biomass}$
Data unit	TJ/tonne
Description	Net calorific value of the non-renewable woody biomass, briquettes or charcoal used in project devices
Source of data	Applied methodology or annual measurement
Value(s) applied	To be determined at CPA level
Measurement methods and procedures	IPCC default for wood fuel, 0.0156 TJ/tonne, based on the gross weight of the wood that is 'air-dried' may be used if fuel used in project device is also woody biomass.
Monitoring frequency	Yearly
QA/QC procedures	Default value shall be used.
Purpose of data	Calculation of emission reduction
Additional comment	This parameter is applicable to CPA that use briquette. For other CPA this is a fixed parameter
Data/Parameter	$B_{new,KPT,i,j}$
Data unit	Tonnes/year
Description	Annual quantity of woody biomass used in tonnes per project device of type *i*
Source of data	Survey report
Value(s) applied	To be determined at CPA level
Measurement methods and procedures	Measured as per the KPT protocol. The KPT shall be carried out in accordance with national standards (if available) or international standards or guidelines (e.g. the KPT Protocol listed by Clean Cooking Alliance (See https://www.cleancookingalliance.org/technology-and-fuels/testing/protocols.html)). The days selected for measurement of fuel consumption shall take into account seasonal/weekly variations in fuel consumption, or else the data from the measurement campaign shall be extrapolated in order to take into account the seasonal pattern. Sampling standard shall be used for determining the sample size to achieve 90/10 confidence/precision levels. If the survey efforts combine two or more CPA, the confidence/precision levels shall be 95/10
Monitoring frequency	Yearly
QA/QC procedures	KPT to be conducted by 3rd party
Purpose of data	Calculation of emission reduction
Additional comment	This parameter is applicable to CPA that use option 2: Kitchen performance test for determining $B_{y,savings}$

Data/Parameter	**Life Span**
Data unit	Number of years
Description	The operating life time of the project device.
Source of data	The operating life time of the project device. The life span should be reported in cases where the PPs are opting to account the efficiency loss as per paragraph 37 of applied methodology
Value(s) applied	To be determined at CPA level
Measurement methods and procedures	Manufacturer (certified by a national standards body or an appropriate certifying agent recognized by that body)
Monitoring frequency	Fixed and recorded at the time of commissioning/distribution
QA/QC procedures	Manufacturer (certified by a national standards body or an appropriate certifying agent recognized by that body)
Purpose of data	Calculation of emission reduction

Additional comment	

Data/Parameter	**Date of commissioning of batch *j***
Data unit	Date
Description	To establish the date of commissioning, the Project Participant may opt to group the devices in "batches" and the latest date of commissioning of a device within the batch shall be used as the date of commissioning for the entire batch
Source of data	Sales or distribution database
Value(s) applied	To be determined at CPA level
Measurement methods and procedures	Non-applicable
Monitoring frequency	Fixed and recorded at the time of commissioning/distribution of the last project device in the batch
QA/QC procedures	CME will conduct quality check of batch commissioning date
Purpose of data	Calculation of emission reduction
Additional comment	To be reported in the monitoring report

Data / Parameter:	Date of commissioning of project device i
Data unit:	Date
Description:	Actual date of commissioning of the project device
Source of data:	Internal records
Measurement procedures (if any):	-
Monitoring frequency:	Fixed and recorded at the time of commissioning/distribution
QA/QC procedures:	-
Any comment:	-

Data/Parameter	$N_{d,HH}$
Data unit	Number
Description	Number of project devices distributed per household
Source of data	Sales or distribution database
Value(s) applied	To be determined at CPA level
Measurement methods and procedures	Recorded in ledger when stove is given to recipient or installed at recipient location then entered in electronic database
Monitoring frequency	Recorded at the time of commissioning/distribution of project devices
QA/QC procedures	The database is sent to the coordinating entity every month for accuracy check, consistency check and archiving.
Purpose of data	Calculation of emission reduction
Additional comment	The results of ex post usage/monitoring survey should not be used to determine the value

I.7.2. Sampling plan

The sampling plan follows the "Standard for Sampling and Surveys for CDM Project Activities and Programme of Activities" (Version 09.0) and uses the "Guideline: Sampling and surveys for CDM project activities and programmes of activities" (Version 04.0)

Sampling Design

a) Due to the large number of ICS envisioned to be distributed as part of the CPAs to be included in the PoA, it is not economically feasible to monitor each individual ICS unit distributed. Therefore, representative sampling will be undertaken as part of a PoA-wide Sampling Plan (by grouping and sampling across CPAs) that is designed in line with the requirements of the "Sampling and surveys for CDM project activities and programme of activities", version 04.

i. Objectives and Reliability Requirements.

The objective is to obtain a reliable estimate of the following parameters over the course of the crediting period and meeting the indicated confidence/precision levels.

Parameter	Description	Objective	Frequency
$n_{y,i,j}$	Proportion of commissioned project devices of type *i* and batch *j* ($N_{0,i,j}$) that remain operating in year *y* (fraction)	Determine the proportion of project devices that remain in operation applying sampling and survey method with 90/10 or 95/10 (as applicable) confidence interval and precision. In cases where survey results indicate that the confidence/precision is not achieved, the lower bound of confidence interval of the parameter value is chosen as an alternative.	Once every two years
μ_y	Adjustment to account for any continued use of pre-project devices during the year *y* (fraction)	Adjustment to account for any continued use of pre-project devices during the year *y* (fraction) applying sampling and survey method with 90/10 or 95/10 (as applicable) confidence interval and precision. In cases where survey results indicate that the confidence/precision is not achieved, the lower bound of confidence interval of the parameter value is chosen as an alternative.	Once every two years
$\eta_{new,i,j}$	Efficiency of the device of each type *i and* batch *j* implemented as part of the project activity	Determine average thermal efficiency of the project stove applying sampling and survey method with 90/10 or 95/10 (as applicable) confidence interval and precision. In cases where survey results indicate that the confidence/precision is not achieved, the lower bound of confidence interval of the parameter value is chosen as an alternative.	At beginning of the project and annually thereafter if the CPA is applying the efficiency drop of a batch on other batched or if the CPA opts to test a representative sample of each batch to use the actual loss rate.

			For CPAs not applying liner depreciation the WBT will be undertaken annually.
$B_{new,KPT,i,j}$	Annual quantity of woody biomass used in tonnes per project device of type *i*	Determine the annual quantity of woody biomass used per project device of type i with a 90/10 confidence/precision or a 95/10 confidence/precision if combined with other CPA. In cases where survey results indicate that 90/10 precision or 95/10 precision (above) is not achieved, the lower bound of a 90% or 95% confidence interval of the parameter value is chosen as an alternative to repeating the survey efforts to achieve the 90/10 or 95/10 precision.	Yearly based on the representative samples.

Monitored Parameter:

$N_{y,i,j}$	Number of project devices of type *I* and batch *j* operating during year *y*
$\mu_{y,i,j}$	Adjustment to account for any continued use of pre-pre-project devices during the year *y*
$\eta_{new,i,j}$	Efficiency of the device of each type *i and* batch *j* implemented as part of the project Activity (Applicable for CPAs opting for option 3 in line with para 32 of methodology)
$B_{new,KPT,i,j}$	Annual quantity of woody biomass used in tonnes per project device of type *i* (Applicable for CPAs opting for option 2 (KPT Approach) in line with para 31 of methodology)

i. Target Population

The overall PoA has 4 target populations determined by the type of improved cook stove disseminated in the CPA (or in a group of CPA)
-Urban Households: households that use primarily charcoal for their cooking needs and are currently using inefficient cooking methods. Improved charcoal stoves will be promoted among this group
-Rural Households: households that use primarily firewood for their cooking needs and are currently using the 3-stone fire method or other inefficient cooking appliances. Improved wood stoves will be promoted among this group.
-Charcoal-using commercial entities or institutions: these are entities or institutions such as restaurants, school cafeteria, hospitals, prisons, etc. that consume large quantities of charcoal using inefficient cooking appliances. Improved institutional charcoal stoves will be promoted among this group
-Firewood-using commercial entities or institutions: these are entities or institutions such as restaurants, traditional breweries, school cafeteria, hospitals, prisons, etc. that consume large quantities of firewood using the 3-stone fire method or other inefficient cooking appliances. Improved firewood stoves will be promoted among this group.

For monitoring, the target population will be the project stoves or baseline stoves used by these different groups.

ii. Sampling method

The sampling method for monitored parameters $N_{y,i,j}$, $\eta_{new,i,j}$ and $\mu_{y,i,j}$ is Stratified Random Sampling and samples will be randomly selected from the primary sampling units as illustrated above. To ensure a random selection of ICS, random number generators shall be applied. Each ICS in the target population is uniquely identifiable by its unique ID number. Each ICS can thus be allocated a Sample Selection Number in each monitoring period, starting at 1 and increasing up to the total number of ICS in the Database for that pre-defined sampling frame. Applying the random number generators, the ICS can then be randomly chosen from the defined population up to the required sample size as calculated by the CME.
If the project stoves come in different sizes the sample size will be divided between different the different sizes for representativeness. The performance of the stoves is not likely to differ from one geographical location to another given the standardization in their manufacturing process.
Therefore, a geographical stratification is not necessary. For this same reason, the CME may elect to select samples from areas where 80% of the project stoves have been distributed.

For the CPAs, a stratified random sampling method will be used for parameters $\eta_{new,i,j}$.

For parameters $N_{y,i,j}$, $\eta_{new,i,j}$ and $\mu_{y,i,j}$ simple random sampling will be used in the areas where at least 80% of the distribution has occurred if the stove comes in one size. If the stove comes in different sizes used by different target groups, stratified random sampling will be used with the stratum being the target group.

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

$N_{y,i,j}$: Visual inspection of the premises to see if ICS is operational and in use. Interview with end user if required to verify that ICS is still in use (Yes/No)

$\mu_{y,i,j}$: Pre project device only is in use then fraction to be used to calculate total number, however if pre project device is used along with project ICS, proportion of usage of each will be determined by cooking habits evaluated by survey questionnaire during the monitoring period.

$\eta_{new,i,j}$: Test to be conducted as per chosen approach during CPA inclusion.

$B_{new,KPT,i,j}$: Test to be conducted as per chosen approach during CPA inclusion.

Using the formulas in the section “Sample Size” below, the CME will randomly sample the required number of ICS from the primary sampling units. It is important to note that for $\mu_{y,i,j}$ where partial usage of both old stoves and project ICS are observed, for each household under sample cooking habits must be taken into consideration.

i. Sample Size

When the parameter of interest is a proportion, the equation below is used. This equation applies to parameters:
$n_{y,i,j}$ Proportion of commissioned project devices of type *i* and batch *j* ($N_{0,i,j}$) that remain operating in year *y* (fraction)
μ_y Adjustment to account for any continued use of pre-project devices during the year *y* (fraction)

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

Where:

n	= sample size
N	=Total population
p	= expected proportion
1.96	= represents the 95% confidence interval
0.1	= represents the 10% relative precision

When the parameter of interest is a mean, the equation below is used. This equation applies to parameter:
Efficiency of the device of each type i and batch j implemented as part of the project activity (Applicable exclusively to CPAs, not opted linear depreciation approach)

$B_{new,KPT,i,j}$ Annual quantity of woody biomass used in tonnes per project device of type i (Applicable for the CPAS opting for KPT not WBT)

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

Where

V	= SD/mean
n	= sample size
N	=Total population
mean	= expected mean
SD	= expected standard deviation
1.96	= represents the 95% confidence interval
0.1	= represents the 10% relative precision

a) Sampling Frame

1) **Sampling frame for proportion of ICS in operation ($N_{y,i,j}$)**
The sample frame refers to all the information sources on the Database. There are two primary mechanisms for data collection: the Registration Process for newly distributed/installed ICS and the Monitoring Survey (which includes a household questionnaire and visual inspection of ICSs) that will be used throughout the lifetime of the PoA. The detailed information collected from Registration Process is used to populate the stoves Database and the Monitoring Survey follows guideline for "Sampling and Surveys for CDM Project Activities and Programme of Activities", version 04.

The PoA is open to different CPA Implementers and different models of ICS including the microscale units. As explained below (on section "Sampling Method"), to take the different characteristics of different CPA Implementer and ICS models into consideration, CPAs shall be grouped together to create a Primary Sampling Unit, which is homogenous. As per EB 86 Annex 04, Appendix-2, paragraph 1, for the use of a single sampling plan covering a group of CPAs, provided the homogeneity of population can be demonstrated, or differences are considered in the sample size calculation, a 90/10 or 95/10 (as applicable) confidence/precision is applied for annual sampling if only SSC CPAs (90/10), combination of SSC CPA and microscale CPA (95/10) and exclusively micro scale CPAs (95/10) are included in verification batches.
If the batches for verification are solely composed of SSC CPAs (with no microscale units), a 90/10 confidence/precision is applied for annual sampling and 95/10 biennial surveys.

The first step is to identify the Primary Sampling Units. Primary sampling units are CPAs, which have:

1. The same CPA Implementer
2. The same ICS models

That is CPAs with the same CPA Implementer and same ICS model 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, these form two different Primary Sampling Units. Same is true if the same CPA Implementer has two different ICS models being implemented – this will form two Primary Sampling Units. This is justified by the fact that CPA Implementer 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 stove model.

2) Adjustment to account for any continued use of pre-project devices during the year($\mu_{y,i,j}$)
In line with applied approved methodology AMS-II.G version 12, as installing data logger is not practical and if any use of pre project devise *can be monitored in a common survey with other monitoring parameters; therefore, a random sub-sample within the common survey can be taken to determine continued use of old cookstoves and its proportional usage by including suitable questionnaire*.

There will be two situations 1) project ICS are completely discarded 2) the old stoves used along with project ICS.

Hence in first case it will be simple multiplication of fraction of total number of project ICS displaced by old cookstoves by total number of cookstoves in CPA, to achieve precise results based on survey result sample size calculation can be repeated.

However, for second case, surveys may be conducted if the use of data loggers to record the continued operation of baseline devices is demonstrated to be not practical, for example when the baseline device is the three-stone fire. The surveys should be designed to capture the cooking habits and stove usage of households in the region, including quantification of use of baseline devices, by formulating questions and/or collecting evidence to determine the frequency of usage of both the project devices and baseline devices. For example, if there were 3 pre-project devices per household and it was determined during the survey that use of one of them continues during the crediting period then a conservative adjustment factor of 0.66 is applied for the relevant monitoring period. Another example would be the case where there was only one pre-project device per household and its use during the project period continues along with the project stove to meet 25% of the cooking needs of the household in which case the adjustment factor will be 0.75. Where a more precise data is available i.e. the thermal capacity of the project and pre-project devices and respective utilization hours, a weighted average adjustment factor may be used.

ii. Quality Assurance/Quality Control

Measurements and interviews will be conducted by third parties such as research institutes, universities, consulting firms or NGO that are experienced in conducting these types of studies. Together with the CME, they will develop a plan that responds to the proposed Sampling Plan.

Monitoring agents engaged by the 3rd party will undergo training on the objectives of the study and on how to treat non-responses. The potential for non-responses, refusals and outliers will be addressed by oversampling. In all cases, each of these occurrences will be documented clearly. The decision to exclude or include an outlier will be made during data analysis. Surveys results will be reviewed daily by a field supervisor so that errors can be corrected promptly while agents are still in the field.

The CME will be responsible for maintaining and storing a database of distributed stoves and for archiving study results in a secure server.

iii. Analysis

Data obtained from the field measurements will be used to estimate the value of the parameters described above. The values will then be factored in the emissions reduction calculation.

Parameter	Description	How data will be used
$n_{y,i,j}$	Proportion of commissioned project devices of type *i* and batch *j* ($N_{0,i,j}$) that remain operating in year *y* (fraction)	The value will be used to adjust the number of devices commissioned so that ER are only accounted for devices that are in use.
μ_y	Adjustment to account for any continued use of pre-project devices during the year *y* (fraction)	The value will be used to exclude the quantity of woody biomass that is used in pre-project devices when these continue to be used along with project devices.
$\eta_{new,i,j}$	Efficiency of the device of each type *i* *and* batch *j* implemented as part of the project activity	The value is used calculate $B_{y,savings}$ based on the difference between the project device efficiency and the pre-project device efficiency. (Applicable for CPAs opting for option 3 of methodology provided under para 31)

b) Implementation

(i) Implementation Plan

Collection of data on stove distribution will occur continuously during the implementation of the CPA. The CME will implement the Sampling Plan during the 12 months preceding the actual field surveys and measurements, including contracting with third parties. These third parties must have the following profile:

-Experience conducting door-to-door surveys
-Experience conducted WBT
-Experience using measuring instruments
-Knowledge of the local language and of French or English
-Cultural awareness
-Data entry skills
-Data analysis skills
-Report writing skills

I.7.3. Other elements of monitoring plan

Operational and management structure

For all the monitored parameters, the CME is responsible for overseeing 3rd party to conduct the surveys and the performance test (WBT, CCT or KPT) although contracting can be done between the 3rd party and the CPA implementer. The sampling plan, data collection and reporting are done by the 3rd party under the supervision of the CME. All contracted 3rd party must apply the CDM standards and guideline on sampling and surveys in effect at the time of the monitoring efforts.

CPA implementers are in charge of maintaining a database of stoves commissioned. These stoves will be identified in the database by type, date of commissioning, name of recipient, address of recipient, phone number (if available) and serial number.

CPA implementers will share this database with the 3rd party monitoring team to select a representative sample of project devices for each of the parameters or a group of parameters. All samples will be randomly selected. When the sample size calculation returns a number less than 30, the monitoring effort will be conducted on a minimum number of 30 samples.

Quality control and Quality assurance

All 3rd party monitoring teams will have at least two layers of quality control and will demonstrate to the CME and to the DOE how the quality control of data is conducted. In addition, the CPA implementer and the CME check the accuracy of the stove commissioning database before sharing it with the monitoring team. Monitoring surveys reports are reviewed both by the CME and the CPA implementer.

Provision for data archiving

3rd party monitoring teams will share all electronic data (database containing selected devices, data analyses, reports, etc.) with CPA project implementer and CME who will save it in a server (i.e. dropbox, Icloud, etc.). All paper documents (e.g. questionnaires) will be provided to CPA implementer for archiving.

Responsibility and institutional arrangement for data collection and archiving

3rd party monitoring surveys team are responsible for locating sample stoves and for collecting data from stove recipients. However, in areas where street addresses do not exist or are not accurate, monitoring survey teams may enlist the help of CPA implementer to locate the devices. The CPA implementer will have no role in data collection.

Grouping of CPA

Several CPA can be monitored at the same time, using the same sampling plan, if they are in the same host country and distributing the same type of stoves.

SECTION J. Crediting period type and duration

7 years 0 months, renewable (second crediting period)

SECTION K. Eligibility criteria for inclusion of CPAs

No.	Eligibility criterion - Category	Eligibility criterion - Required condition	Supporting evidence for inclusion
1	Geographical boundary	CPA shall be implemented within the geographical boundaries of one of the host countries: Togo, Burkina Faso, Senegal, Mali and Ghana.	The CPA DD will clearly describe the country where the CPA is being implemented and will provide GPS Coordinates of the areas.
2	Conditions to avoid double counting of GHG emission reductions	CME have procedures in place to avoid double counting with other CPA and other CDM projects. These procedures include having "second-tiers" contracts with stove manufacturers who work under the main manufacturer to ensure that the rights to the ER are all attributed to the CME, and having the CME logo, the CPA name and a serial number on every stove.	Each stove will carry a logo as a way of identifying the PoA, and a serial number that identifies the host country, the CPA number and the stove itself. The serial number protocol is described in section H.3 above. Pictures of stoves and the serial number will serve as evidence. Furthermore, the serial numbers will be listed in the CPA database. Documents • Sales receipt • the programme logo shall be displayed on the CEPs and verifiable by the DOE • Booking Records Pictures with serial number
3	CER ownership	End users receiving ICS under the specific CPA contractually cede their rights to claim and own emission reductions under the Clean Development Mechanism of the UNFCCC to the CME of the PoA	The default ICS sales records is including the provision that emission reductions generated by the ICS are transferred from the end-user to the Partner Organization (PO) and ultimately owned by the CME Documents: 1. ICS Sales Record 2. Contract to cede the CER ownership
4	Conditions to confirm that CPAs are not part of other CDM project activities or POA	Provide statement/ confirmation in the CPA-DD that the CPA is not part of another CDM project activity nor of a POA and is not deregistered CPA or CDM project activity	Declaration from CPA implementer as part of their contract with the CME, stating that their activities are not registered as part of another CDM project activity nor of a POA and is not deregistered CPA or CDM project activityPrior to inclusion, CME will check CDM project database to ensure that

			CPA is not listed as a project activity or a CPA under a POA or has not been deregistered. Documents: • Declaration from CPA implementer CPA to be included is not part of another CDM project activity nor of a POA and is not deregistered CPA or CDM project activity • CME check confirmation that CPA to be included is not part of another CDM project activity nor of a POA and is not deregistered CPA or CDM project activity
5	Awareness and Agreement of those operating a CPA on PoA subscription	Contractual provisions to ensure that CPA implementers are aware and have agreed that their activity is being subscribed to the PoA. In the case that the CME is not responsible for implementing the CPA, the organization responsible for CPA implementation, known as the CPA Implementer, has signed a contractual agreement with the CME to participate in the PoA. This agreement will encompass: - Defines the ownership of the carbon emission reduction rights - Covers the CPA implementer's distribution and monitoring related responsibilities - Confirms that the ICS to be distributed under the CPA have not and will not be distributed under any other carbon project (CDM project, PoA or voluntary carbon market project) - Cedes the PO's rights to the carbon credits generated from CPAs under the PoA to the CME	Contractual agreement for CPA operators, stating that they are aware and have agreed that their activity is being subscribed to the PoA. Document: • Contractual agreement for CPA operators and CME
6	Specification of technology/measure	The CPA will involve the sale or distribution of an improved	Tests conducted according to the standards provided in the

		biomass cooking technology that is proven to have a minimum specified efficiency of 20%	methodology, or manufacturer specifications based on WBT that meet the 90/10 precision requirement or 95/10 if combined with other CPA. Documents: • Technical Specification • Lab Test Results (WBT) • Equivalent supportive
7	Conditions to check start date	document very clearly the start date of the CPA and evidence that the start date of the CPA is not prior to the date the PoA-DD was first published for global stakeholder consultation.	The start date of each CPA will be evidenced by a proof of commissioning of the first stove, a contractual agreement between the Coordinating Entity and the CPA implementer or by contracts such as lease agreement or purchase agreements signed by the CPA implementer to start operations. The PoA-DD was first published on 24/02/2011. No CPA will have a start date prior that date. Documents: • Proof of commissioning of the first stove under CPA • Contractual agreement between the Coordinating Entity and the CPA implementer • Contracts such as lease agreement • Contracts such as lease agreement or purchase agreements signed by the CPA implementer to start operations
8	Conditions to check compliance with applied methodology	Comply with the applicability criteria of the Methodology AMS II G version 12.0: - deploy appliances involving the efficiency improvements in the thermal applications of non-renewable biomass and -in the case of cookstoves, deploy single pot or multi-pot or in-situ cookstoves with the rated efficiency of at least 20% -demonstrate that non-renewable biomass has been used since 31 December 1989, using survey methods or referring to published literature, official reports or statistics. -explain the method of distribution of project devices	-Each CPA will promote improved biomass cook stoves which are efficiency improvement appliances in thermal application. This will be evidenced in the CPA-DD and in the reports of any feasibility study or baseline study conducted for the CPA. -CPA will demonstrate in their CPA-DD that the project stoves have at least a rated efficiency of 20% -Non-renewable biomass use in the host country since 31 December 1989 will be researched in published literature and official reports or statistics. This will be reported on in baseline study reports -CPA will explain in their CPA-DD how they intend to distribute project stoves

		including methods for avoiding double-counting	Document: • CPA-DD
9	CPA Crediting Period	CPA starting date of the crediting period is date of inclusion or any date thereafter and crediting period not to exceed the PoA end date. Each CPA shall provide verifiable evidence	The end date of the crediting period end of CPA will not exceed end date of PoA Duration i.e. 23/02/2039. The end date of CPA will be restricted to 23/02/2039 in case it exceeds. Document: • CPA-DD
10	Conditions for additionality	The additionality will be demonstrated following the requirements of Tool 21: Demonstration of additionality of small-scale project activities, version 13.1; Tool19: Demonstration of additionality of microscale project activities, version 09.0; Or requirements of para 17 to 20 of applied methodology	Efficiency test reports and baseline consumption reports will be used to calculate the energy savings of each stove and to demonstrate that it does not reach 9 GWh/year each The additionality will be demonstrated at the CPA level following the requirements of Tool 21 and Tool 19. Document: • CPA-DD
11	Conditions to ensure compliance with other requirement of the methodology	Comply with the generic CPA DD which already ensures compliance with all requirements of the applied methodology, tools and Standards	Compliance with generic CPA DD will reviewed prior to inclusion of CPA. Document: • CPA-DD
12	POA-specific requirements: local stakeholder consultation and environmental analysis	CME/ CPA implementer will hold a local stakeholder consultation that meets these minimum requirements: -be a physical meeting or remote web-based meeting (considering COVID pandemic or as per applicable regulatory requirements) -invite parties that will be impacted by the projects or who are involved in the cook stove sector (end-users, NGO, government agencies) -provide an overview of the project -collect comments from participants -take account of the comments A single stakeholder consultation can be held for multiple CPA located in the	Stakeholder consultation report and reporting in the CPA-DD of comments and how they were taken into account. Environmental Impact Analysis report or local regulation or statement from relevant government authority confirming that an EIA is not required by the host country Documents: • LSC report • EIA (in case applicable)

		same host country provided that the type of cook stove promoted by each CPA is well presented and all the CPA are included within 5 years of the date the meeting was held. Conduct an Environmental Impact Analysis if required by the host country. One EIA can be applicable for several CPA if located in the same host country provided that local laws on EIA do not differ.	
13	Affirmation of non-ODA diversion	State clearly in the CPA-DD the source of public funding, if any and also that there is no diversion of ODA	Contractual agreement between funder and CPA implementer or CME. If there is no funding, statement from the Coordinating Entity that there is no diversion of Official Development Assistance. If there is funding, statement from the funder that funds are not a diversion of ODA Documents: • CPA-DD • Statement that no ODA are involved for CPA implementation
14	Target group and distribution mechanism	serve households, commercial entities and institutions in the host countries either in urban, peri-urban or rural areas. Distribute the stoves through direct or indirect sale	The type of stove promoted will define the target group. Each CPA-DD will state very clearly the target group and the distribution mechanism used. Documents: • CPA-DD
15	Baseline parameters to be established at CPA level	Each CPA shall demonstrate how the baseline parameters for baselines not established at the PoA level (that applies for baselines) that are to be calculated at the CPA level have been determined. Parameters to be monitored are listed in CPA-DD	CPA-DD outlines the approach and provide supporting documents used for determining parameters. If local surveys or representative sampling are used then copies of questionnaires, sampling design etc shall be provided. Documents: • CPA-DD • Survey records • Publicly available data • CPA's or project activities under other Programs example GS • Other evidences as applicable
16	Sampling	Provide a sampling method (e.g. in the monitoring plan and baseline studies) that	The sampling plan presented in baseline study reports and in the monitoring plan of the CPA-DD

		follows the "Standard For Sampling And Surveys for CDM Projects and Programmes of Activities (Version 9.0). Please refer provision of section I.7.2 of PoA-DD. If leakage related to the non-renewable woody biomass saved by the project activity is found to be true, an adjustment factor of 0.95 will be applied to B_{old} as an alternative to conducting surveys. Sampling across CPA is possible if the CPA are located in the same country and are disseminating the same type of cook stove	will serve as evidence. Documents: • CPA-DD • Baseline study reports • Usage Surveys
17	SSC threshold	The SSC Threshold demonstration is subjected to availing the route for additionality demonstration Route 1: (option 2, para 21 of the applied methodology AMS II.G version 12): The CPA-DD will demonstrate that annual energy savings data does not exceed the small threshold of 180 GWh/year, for each year of the crediting period. Route 2 (option 3, para 22 of the applied methodology AMS II.G version 12): Alternatively, if the additionality is demonstrated by Route 2, then the SSC threshold will be limited to 20 GWh per year Route 3 (option 1, para 17-20 of the applied methodology AMS II.G version 12): The CPA-DD will demonstrate that annual energy savings data does not exceed the small threshold of 180 GWh/year, for each year of the crediting period.	Ex-post ER calculation spreadsheet will demonstrate that the applicable SSC threshold is not exceeded. Documents: • CPA-DD
18	De bundling check	The CPA-DD will demonstrate that the stoves do not realize more than 1.8 GWh of energy savings	Efficiency test report and baseline consumption reports will serve to calculate the energy savings of each stove. Documents:

		annually each as a proof that a de-bundling check is not required.	• CPA-DD

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

Coordinating/managing entity and/or project participants	☒ Coordinating/managing entity ☐ Project participant
Organization name	Toyola Energy Limited
Country	Ghana
Address	Toyola House Faase Village, Sapeiman, Accra, Ghana
Telephone	N/A
Fax	N/A
E-mail	Toyolaenergy@yahoo.com
Website	N/A
Contact person	Suraj Wahab Ologburo

Appendix 2. Affirmation regarding public funding

There is no public funding to implement the POA

Appendix 3. Applicability of methodologies and standardized baseline

Not applicable

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

Not applicable

Appendix 5. Further background information on monitoring plan

Not applicable

Appendix 6. Summary report of comments received from local stakeholders

Not applicable

Appendix 7. Summary of post-registration changes

PRC applicable during the Renewal of the Crediting Period

Corrections

- Minor spelling correction and removing of spaces between words and paragraphs.
- Change of fonts used in the document where different fonts were initially used.
- The sentences have been rephrased to reflect more accurate information and the information materially remains the same.
- The date, version of the PoA-DD has been updated.
- The CME has revised the PoA-DD in latest template version of PoA-DD (version 09.0) available on CDM EB website, hence some editing and restructuring of information has been done by CME, due to change of PoA-DD template from old version to new version.
- The new sections available in the latest template of the PoA-DD have been filled. Some of the information is same which has already been validated by the previous DOE at the time of the validation of the registered PoA. While the new information has been validated by the assessment team as presented in various sections of this Validation Report. The same has been confirmed through the registered PoA-DD and the corresponding Validation report available on the UNFCCC website.
- The CME has been changed from '*E+Carbon' to 'Toyola Energy Limited*' the DNA has no objection to this transfer of the CME and this change is already updated on UNFCCC interface.
- Updated the contact information of the CME and project participant which has been provided under Appendix 1 of the PoA-DD.
- The summary of PRC details have been provided in Appendix 7 of the PoA-DD.
- The Coordinating and Managing Entity of the PoA has changed subsequent to the registration of PoA.

Permanent Changes in Monitoring Plan

- Update in the applied methodology and corresponding changes in the ex-ante fixed values, MP, ER calculations
- Updates as per associated guidelines, standards for sampling

Changes to the programme design

- The additionality demonstration as per Tool 21
- Update in the eligibility criteria following applied methodological tools and other requirements

Change of CME

- The CME has changed, based on the Letter of Authorization to Toyola Energy Limited as the new Coordinating/Managing Entity

Following Changes are considered for PRC and clubbed with the 'RCP' from the last approved PoA DD, version 15,

S.N.	Title	Last update
PRC-9666-001	Promoting Efficient Stove Dissemination and Use in West Africa.	03 Dec 14

A. CME Change: CME has been changed from 'E+ Carbon' to 'Toyola Energy Limited', revised LoAs were already submitted to UNFCCC through dedicated registry account, only name updated in the PoA DD in line with the provisions of CDM PS for PoAs, version 02.

B. Update of the additionality section in the PoA-DD and eligibility criteria to reflect the change in line with the latest version of methodology, explicitly micro scale approach has been also updated, option was not available in the version 04 of methodology applied in registered PoA DD.

C. Opted for the provision of paras 31 & 32 for determining the baseline fuel consumption and only retained the corresponding ex-ante/monitoring parameter corresponding to option 2 & 3. Para 28 of the applied methodology states. Registered PoA DD has all the four options available. Eligibility criteria also updated to reflect this change as only one option to be opted in one CPA. Sampling section updated with the changes made as per para 31 & 32 of methodology and latest version of sampling guideline/standard.

D. Editorial changes corresponding to the requirements of updated template.

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Document information

Version	*Date*	*Description*
09.0	31 May 2019	Revision to: • Ensure consistency with version 02.0 of the "CDM project standard for programmes of activities" (CDM-EB93-A07-STAN); • Make editorial improvements.
08.1	28 June 2017	Revision to: • Remove a duplicated instruction; • Make editorial improvement.
08.0	7 June 2017	Revision to: • Improve consistency with the "CDM project standard for programmes of activities" and with the PDD and CPA-DD forms; • Make editorial improvement.
07.0	25 May 2017	Revision to: • Ensure consistency with the "CDM project standard for programmes of activities" (CDM-EB93-A07-STAN) (version 01.0); • Incorporate the "Programme design document form for small-scale CDM programmes of activities" (CDM-SSC-PoA-DD-FORM); • Make editorial improvement.
06.0	15 April 2016	Revision to ensure consistency with the "Standard: Applicability of sectoral scopes" (CDM-EB88-A04-STAN) (version 01.0).
05.0	9 March 2015	Revision to: • Include provisions related to choice of start date of PoA; • Include provisions related to delayed submission of a monitoring plan; • Provisions related to local stakeholder consultation; • Add exception for generic CPA where technology is under positive lists; • Make editorial improvement.
04.1	5 August 2014	Editorial revision to correct the document information table.

Version	*Date*	*Description*
04.0	25 June 2014	Revision to: • Include the Attachment: Instructions for filling out the project design document form for CDM programme of activities (these instructions supersede the Guideline: Completing the programme design document form for CDM programme of activities (Version 04.0)); • Include provisions related to standardized baselines; • Add contact information on a responsible person(s)/ entity(ies) for the application of the methodology (ies) to the PoA in B.4 and Appendix 1; • Add general instructions on post-registration changes in paragraphs 2 and 3 of general instructions and Appendix 6; • Change the reference number from F-CDM-PoA-DD to CDM-PoA-DD-FORM; • Make editorial improvement.
03.0	3 December 2012	EB 70 Revision to reflect changes to the *Guideline: Completing the programme design document form for CDM programmes of activities* (EB 70, Annex 6).
02.0	13 March 2012	EB 66 Revision required to ensure consistency with the "Guidelines for completing the programme design document form for CDM programmes of activities" (EB 66, annex 12).
01.0	27 July 2007	EB 33, Annex 41 Initial publication.

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