Programme design document form for small-scale CDM programmes of activities

(Version 05.0)

Complete this form in accordance with the Attachment "Instructions for filling out the programme design document form for small-scale CDM programmes of activities" at the end of this form.

PROGRAMME DESIGN DOCUMENT (PoA-DD)	
Title of the PoA	Tandavanala *TsinjoHarena* Improved cookstoves in Madagascar
Version number of the PoA-DD	03
Completion date of the PoA-DD	03/03/2017
Coordinating/ managing entity	Tandavanala
Host Party(ies)	Republic of Madagascar
Applied methodology(ies) and, where applicable, applied standardized baseline(s)	Applied Methodology: AMS II.G "Energy efficiency measures in thermal applications of non-renewable biomass" Reference: EB 90 Annex-13, valid from 22/07/2016
Sectoral scope(s) linked to the applied methodology(ies)	03

PART I. Programme of activities (PoA)

SECTION A. General description of PoA

A.1. Title of the PoA

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Tandavanala *TsinjoHarena* Improved cookstoves in Madagascar
Version-03
Date: 03/03/2017

A.2. Purpose and general description of the PoA

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Tandavanala *TsinjoHarena* Improved cookstoves in Madagascar, a SSC CDM Program of Activities (PoA) is an initiative to be implemented by Tandavanala, a local NGO registered in Madagascar. In host country Madagascar, the use of wood energy is significant as 92% of the total energy used by Malagasy households comes from forests[1]. The energy supply in Madagascar is dominated by Wood Energy (92%), petroleum products contributes only 7%. The proportion of renewable energy still remains marginal with less than 1% of this offer[2] and wood Energy is mainly used as fuel for cooking at household. Firewood is the type of Wood Energy consumed by 82.2% of households in Madagascar, while the charcoal is consumed by 17% of Malagasy households, which are mainly in urban areas. With over 70% of the population living in vulnerable situations, firewood remains the main energy access by rural households while charcoal remains the source of most energy used by urban households for cooking[3]. In rural areas, 91% of households still use wood (wood picked on forest and wood purchased), against 45% in urban areas. Regarding the way of use of this energy, a large proportion of households depend of traditional cookers named “03 stones or triangle iron” named "toko” remains the most common practice[4].

A.□. Policy/measure or stated goal of the PoA

The main objective of this SSC PoA, through implementation of several CPAs, is the dissemination of the efficient improved cooking stove to the rural and urban household of Madagascar resulting in the reduction of firewood consumption leading to climate change mitigation in a sustainable manner. Overall objectives are reduction of greenhouse gases, conservation of forests and woodlands as well as improved health conditions of ICS users due to improved indoor air quality.

The individual house holds using ICS will sign an agreement with the CME acknowledging the inclusion of their stove into CPAs under this PoA.

With respect to each CPA, the CME/CPA implementer may potentially distribute information about the benefits of undertaking such programme including its associated economic, social and environmental benefits. This will help in creating awareness amongst interested stakeholders.

[1] WWF, Diagnostic du secteur énergie à Madagascar, Report, September, 2012

[2] WWF, Diagnostic du secteur énergie à Madagascar, Report, September, 2012

[3] WWF, Diagnostic du secteur énergie à Madagascar, Report, September, 2012

[4] WWF, Diagnostic du secteur énergie à Madagascar, Report, September, 2012

2. Framework for the implementation of the proposed PoA

Tandavanala is the coordinating/managing entity ("CME") for this SSC-PoA. Tandavanala is also manufacturer and supplier of improved cooked stove. The PoA will facilitate the dissemination of ICS manufactured by Tandavanala and other appropriate ICS manufactured by other technology suppliers meeting CPA eligibility criteria as well at a subsidized rate to the end user. Carbon revenues will be used to fund ICS distribution and to cover monitoring costs.

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. The CME will request the inclusion of new CPAs to the PoA through the DOE during the lifetime of the PoA.

Tandavanala would coordinate with the users of ICS to ensure that all requirements with respect to a CDM PoA such as assisting with validation and registration, record keeping, monitoring and survey of households at a regular interval are met. In addition to implementing the activities as per design and complying with the requirements of the CDM-PoA, the programme management would also be responsible for the environmental integrity of the programme.

ICSs may be distributed directly by the CME or alternatively through the Designated Operators (Dos) or other partners, such as technicians, retailers, agents or other sub- contracted third parties. The PoA aims to leverage carbon finance to build robust supply chains that enable previously underserved communities to gain access to improved energy saving technologies. Additional partners and networks will be progressively added to the project activities. Local partnerships will allow for targeted campaigning and marketing to diverse distribution locations throughout the country. Each partner will be responsible for directly managing all parties under their partnership as well as collecting/maintaining appropriate monitoring and distribution records.

A record keeping system and unique identification of the project is made possible by user's information collected through the Beneficiary Agreement and compiled in distribution record. This will include user name, identification number and address/location of the user's house, stove unique serial code (e.g. 16THW100001) for wood stoves, and distribution date. The record keeping system will ensure that each ICS can be traced to one specific CPA to avoid double counting.

The serial code will be 16THWX1-XXXX1 stating:
The inscription 16 stand for particular year, THW for TANDAVANALA woody biomass cook stove, Serial number X1 stands for CPA number and XXXX1 stand for serial number.
Similarly for charcoal based ICS, the serial number will be 16THCX1-XXXX1, where THC stands for TANDAVANALA charcoal based cook stove.

When the operating life of ICS is over, it will be replaced by a new IC stove and during the replacement process, the identification number of the ICS will be same as the total number of stove per CPA will have to be same. In case the user is not willing to replace the ICS, a new user will be provided with the ICS with the same number thereby keeping the total number of stove in a CPA same.

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

The CME confirms that the PoA, and all actions taken as part of it, are voluntary and coordinated. A review of the national energy policies of the country shows that there are no mandatory laws, policies or requirements mandating the use of ICS.

Sustainable development benefits

The following sustainable development benefits are envisaged from the programme.

a) Environment well being

i. The programme will lead to the reduction in GHG emission due to reduction in use of non- renewable biomass and it will also ensure natural recovery of forests and/or reforestation.
ii. The programme will lead to reduction in Indoor Air Pollution from wood smoke and avoid smoke related health disorders
iii. The reduction in biomass/charcoal consumption for cooking through efficient use leads to improved ecological balance.
iv. The protection of standing forests will ensure the maintenance of watersheds that regulate water table levels and prevent flash flooding
v. The programme will lead to prevention of fire hazards in the household kitchen and the improved cooking stove technology is environmentally safe

b) Social well being

i. The programme will contribute to the preservation of wood resources so as to avoid inter- communal and/or inter-ethnic conflict over resources.
ii. There will be reduction of the workload as a result of reduced in time for collecting the firewood, which can be used more productively in other income generating activities.
iii. The programme will effectively address gender and poverty reduction issues through increased economic activities and employment opportunities bringing about better living conditions.

c) Economic well being

i. The fabrication, operation and repair and maintenance of ICS's are expected to provide employment to the local people.
ii. The costs incurred in the purchase of firewood/charcoal will be reduced through increased efficiency of the ICS thus leading to lesser firewood consumption.

d) Technological well being

The introduction of locally manufactured technology with improved energy efficiency helps in technological self-reliance in the area.

A.3. CME and participants of PoA

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Tandavanala is the managing/coordinating entity (CME) of the PoA and would communicate with the Board. The contact details of Tandavanala are provided in the Appendix 1 of this PoA DD. Tandavanala will implement, monitor, maintain the database, support private sector, quality control, fund administration and awareness creation including management of the ICS programme.

A.4. Party(ies)

Name of Party involved (host) indicates host Party	Private and/or public entity(ies) project participants, CME (as applicable)	Indicate if the Party involved wishes to be considered as project participant (Yes/No)
Republic of Madagascar (host)	Private entity -Tandavanala	No
Norway	Public Entity-Norwegian Ministry of Climate and Environment	No

A.5. Physical/ Geographical boundary of the PoA

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The geographical area, within which all CPAs included in this PoA will be implemented, is the territorial boundary of Madagascar, the Host Country of the PoA.

Each CPA will be limited by the territorial boundary of the Host Country in which it is located, and the physical location of stoves distributed in that CPA will form the actual CPA boundary.

Fig: Project boundary

A.6. Technologies/measures

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A typical SSC-CPA will replace conventional firewood stoves with higher efficiency ICS models by leveraging resources provided by the PoA in rural areas, while it also envisage to replace conventional charcoal stoves in urban areas. ICSs are more efficient than conventional firewood/charcoal stoves as they reduce heat loss and improve heat transfer and/or combustion efficiency. A standard manufacturer Water Boiling Test (WBT) for each model implemented will substantiate stove performance (efficiency). Each respective SSC-CPA-DD will describe the technical specification of the cook-stove envisaged for dissemination under the CPA.

The ICS models are fuel efficient, resulting in a decrease in fuel use in comparison to conventional pre-project stoves while also reducing particulate matter and carbon emissions. Design considerations have also streamlined assembly and construction to reduce costs and production times.

The project activity will continually assess biomass and charcoal stove technology options with the goal of providing the high performing, affordable and locally appropriate technologies to the local environments when possible. As the PoA expands, several models of biomass and charcoal stoves produced by Tandavanala and/or other manufacturers may also be included in the PoA. Inclusion of such stoves would be subject to compliance with requirements of the

methodology and the eligibility criteria of the PoA. The CME is committed to investing in research and development for the improvement of the current stoves being disseminated. Thus, during the life of the PoA, research and development may result in dissemination of more efficient ICS models, which shall be absorbed by this SSC-PoA, subject to methodological and eligibility criteria of the PoA. Upon inclusion into the project activity, all appliances will remain valid throughout the lifetime of the project period until the CME chooses to discontinue crediting of the improved stoves. Each CPA will provide a detailed description on the specific stove model/s implemented/ envisage to be implemented and the target customers for each of them.

A.7 Public funding of PoA

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This PoA has not received public funding from Annex I parties that could result in a diversion of official development assistance. This will be proven in each CPA of the program.

SECTION B. Demonstration of additionality and development of eligibility criteria

B.1. Demonstration of additionality for PoA

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The proposed PoA is a voluntary coordinated action by Tandavanala. There is no mandatory law or requirement in Madagascar to foster the dissemination of improved cook stoves. Hence this voluntary coordinated action would not be possible in the absence of the PoA, due to the cost associated with it.

Under this PoA, the additionality of the project activity is demonstrated by a barrier analysis that is in line with EB 83, Annex 14, “Demonstration of additionality of small-scale project activities” (version 10) where it says as follows:

According to para 11 of the “Demonstration of additionality of small-scale project activities” Documentation of barriers, as per paragraph 1 above, is not required for the positive list of technologies and project activity types that are defined as automatically additional for project sizes up to and including the small-scale CDM thresholds.

In line with para 11 (c) Project activities solely composed of isolated units where the users of the technology/measure are households or communities or Small and Medium Enterprises (SMEs) and where the size of each unit is no larger than 5% of the small-scale CDM thresholds.

As part of the CPA inclusion check, it has to be demonstrated for each CPA that it is exempted from performing the debundling check, since if each of the independent subsystem/measures included in the CPA of a PoA is no larger than 1% of the small scale threshold defined by the methodologies applied (Methodological tool: Assessment of debundling for small-scale project activities, v04, EB 83, Annex 13, par. 14).

Since the criterion for exemption of the debundling check is stricter than the criterion for automatic additionality, additionality is given if the debundling check is passed and does not need to be assessed separately.

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

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The eligibility criteria for inclusion of CPA in the PoA have been developed inline with EB 87, Annex 03. According to this the following criteria must fulfilled by each CPA to be included in the PoA.

S. No	Eligibility Criteria		Evidence (to be checked for CPA inclusion)
	Category	Description	
1	The geographical boundary of the CPA including any time-induced boundary consistent with the geographical boundary set in the PoA	The PoA boundary corresponds to the boundaries of host country Madagascar. All distributed ICS in each CPA shall be located within geographical boundary of Madagascar.	Location and boundary is specified in the specific CPA-DD stating that the ICS location is limited to Madagascar and is supported by Sales records of ICS.
2	Conditions that avoid double counting of emission reductions like unique identification of product and end-user locations	A unique numbering system for ICS will be applied in each CPA, assigning a unique number to each ICS and allowing to clearly identify for each ICS to which CPA it belongs.	The ICS installed in any CPA under this PoA shall be uniquely identifiable by unique numbering and will be supported by the distribution records. Each ICS distributed will include CPA assignment and will have corresponding end user details (i.e. name, address etc.). Additionally, unique id shall be displayed on the stove itself. The unique numbering or identification regime is included in the specific CPA-DD and will be verifiable by the DOE.
3	The specifications of technology/measure including the level and type of service, performance specifications including compliance with testing/certifications	CPAs under this PoA will consist in the distribution of ICS with a thermal efficiency of at least 20% to household users cooking with non-renewable biomass or charcoal in the baseline scenario. The CPA consists of replacement of conventional firewood/charcoal cook-stoves for biomass/charcoal fired ICS as defined in the PoA-DD. Stove types replaced and implemented will be defined in the CPA-DD, and hence appliances involving the efficiency improvements in the thermal applications of non-renewable biomass as per AMS II. G.	Type of conventional cook- stoves replaced and ICS type/s implemented and compliance with the technological requirements of AMS II.G will be described in the specific CPA-DD. Furthermore as described in A.2 of PoA DD, the charcoal stoves will only be distributed in urban/semi urban areas. Document: Project product data sheets or specification or product information sheets from manufacturer / Stoves

			sales records.
4	Conditions to check the start date of the CPA through documentary evidence	Any CPA start date shall not be before the PoA starting date i.e. date when PoA DD is published for Global Stakeholder Comments on UNFCCC.	Starting date as stated in the CPA-DD. Each CPA shall provide verifiable evidence of the CPA start date as demonstrated. Evidence may include but are not limited to: - First ICS Sale Receipt, and/or - Shipping orders of ICS.
5	Conditions that ensure compliance with applicability and other requirements of single or multiple methodologies applied by CPAs	A CPA shall consist in the distribution of ICSs with efficiency improvements in thermal applications of non-renewable biomass/charcoal. ICS shall have a thermal efficiency of at least 20%.	CPA-DD shall specify on type(s) and efficiency measurement(s) of ICS used.
6	The conditions that ensure that the CPA meets the requirements pertaining to the demonstration of additionality	The additionality of the project activity is demonstrated by a barrier analysis that is in line with para 11 c) of EB 83, Annex 14, “Demonstration of additionality of small-scale project activities” (version 10)	Each of the requirements listed below are proven to define the CPA as automatically additional. The specific CPA is eligible when all evidences are documented: 1) Project size does not exceed small-scale CDM thresholds 2) The project activities are solely composed of isolated units where the users of the technology/measure are households: CPA-DD to show description of the technology and specifies target population, and; 3) Where the size of each unit is no larger than 5% of the small-scale CDM thresholds: CPA-DD to show energy saved by the ICS is less than (180 GWhth /year * 0.05 =) 9 GWhth /year.

7	The PoA-specific requirements stipulated by the CME including any conditions related to undertaking local stakeholder consultations and environmental impact analysis	The local stakeholder consultation will be conducted at the PoA level (Section F of the PoA-DD). Each CPA will be implemented in similar social economic situations. The key stakeholders of the program both at PoA and CPA level are the same. An environmental impact analysis is not required (section E.2 of the PoA-DD). No further actions needed at the CPA level to satisfy the eligibility criteria.	The conditions to meet the requirements on undertaking the local stakeholder consultation have been proven in section D of the PoA-DD. The conditions to meet the requirements on undertaking the environmental impact assessment have been proven in the PoA-DD.
8	Conditions to provide an affirmation that funding from Annex I Parties, if any, does not result in a diversion of official development assistance	The CME and the CPA operator (in case of being different from the CME) shall confirm that in case of public funding, there is no diversion of Official Development Assistance.	Statement of CME and the CPA operator (in case of being different from the CME) on use of ODA. In case of ODA involved in funding or pre-funding parts of a CPA, a confirmation that no diversion of ODA occurs will be provided.
9	Where applicable, target group (e.g. domestic/commercial/industrial, rural/urban, grid-connected/off-grid) and distribution mechanisms (e.g. direct installation)	Distribution mechanisms have been specified in the PoA-DD by means of the "General operating and implementing framework of PoA" at the PoA level. The distribution mechanism is the direct distribution of ICS through the CME or regional partners.	The selected distribution mechanisms included in each CPA are distinguished in each CPA. The same can also be verified by agreements to be signed with ICS users, confirming that traditional wood stoves were used for cooking in the baseline situation and type of user.
10	Where applicable, the conditions related to sampling requirements for the PoA in accordance with the "Standard for sampling and surveys for CDM project activities and programme of activities"	Monitoring of all CPAs will adhere to all requirements related to sampling for a PoA in accordance with the sampling standard including all annexes and amendments till EB 86 Annex 03.	Specification of the sampling methods applied and compliance with the sampling requirements are established at the PoA-DD. For each CPA-DD Sampling will be

			undertaken as part of the PoA Sampling Plan, and in the CPA-DD describes how the PoA Sampling Plan is to be applied
11	Where applicable, the conditions that ensure that every CPA (in aggregate if it comprises of independent sub units) meets the small-scale or microscale threshold and remains within those thresholds throughout the crediting period of the CPA	The CPA shall remain under the applicable SSC limits for each component, which is 180 GWh/annum thermal energy savings (threshold as per clarification request SSC_233) for all ICS distributed under the CPA.	The maximum number of ICS estimated is to be defined in the specific CPA-DD. The number of ICS in operation per year will not exceed the "ICS installation cap" established in the specific CPA- DD. This cap in essence will be the maximum number of ICS installed up to the threshold of 180 GWhth/annum thermal energy savings. Each CPA-DD will establish the "ICS installation cap" through the ER calculation tool developed based on the relation between the "energy cap established for this type of activity" and the "energy savings per ICS". This relation will vary according to the parameters monitored along the CPA life cycle, for instance $\eta_{new,i}$ and $\mu_{y,i}$. Therefore an updated "ICS installation cap" will be provided at the time of verification according to the monitoring results.
12	Where applicable, the requirements for the debundling check, in case the CPAs belongs to small-scale or microscale project categories.	If each of the independent subsystems/measures included in the CPA of a PoA is no larger than 1% of the small-scale thresholds defined by the methodologies applied, then the is exempted from performing de-bundling check (EB 83, Annex 13) 1%	The following will be used to ensure this requirement Manufacturer specification and/or CPA-DD to show energy saved by an ICS is less than 1.8 GWhth/year using

		of SSC limits correspond to energy savings of 1.8 $GWh_{thermal}$ per annum	excel sheet or similar tool.
13	Approval of CPA by CME	The CME approves each CPA to be included into its registered PoA.	Statement of CME giving approval for the CPA to be included into its registered PoA.
14	CER ownership	End users receiving ICSs 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.	A default sales agreement for end users including the provision that emission reductions generated by the stove are owned by the CME will be provided for each CPA.
15	Awareness and agreement of those operating a CPA on PoA subscription	Contractual provisions to ensure that those operating the CPA are aware and have agreed that their activity is being subscribed to the PoA.	Evidence for inclusion, in case CPA operators are different from the CME: A declaration from CPA operators, stating that they are aware and have agreed that their activity is being subscribed to the PoA will be provided for each CPA.

B.3. Application of technologies/measures and methodologies

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The PoA and its CPAs will apply a single approved small-scale methodology as mentioned below

Type II – Energy Efficiency Improved Projects

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

Version: 08

The methodology measures below constitute the justification for the choice of the selected methodology by showing that each CPA meets each applicability condition of the methodology.

S. No	CDM Methodology requirement	Project justification
1	This methodology comprises efficiency improvements in thermal applications of non- renewable biomass. Examples of applicable technologies and measures include the introduction of high efficiency	All project technology models implemented will provide efficiency improvement in the thermal application of the non-renewable biomass. Examples of these technologies and

	biomass fired project devices (cook stoves or ovens or dryers) to replace the existing devices and/or energy efficiency improvements in existing biomass fired cook stoves or ovens or dryers	measures are the introduction of high efficiency biomass/charcoal fuelled ICS. The CME will also replace the charcoal based stove by efficient carcoal stoves, as charcoal in host country is produced in unsustainable manner using renewable biomass, hence these will also led in reduction of non-renewable biomass. This criteria will be ensured by recording the baseline stove used prior to ICS installation.
2	In the case of cook stoves, the methodology is applicable to introduction of single pot or multi pot portable or in-situ cook stoves with rated efficiency of at least 20 per cent.	The single pot or multipot portable or in situ improved cooking stoves will have a specified efficiency of at least 20% as tested and certified by third party. Every ICS model implemented in the CPA will present a certificate issued by manufacturer or an appropriate certifying agent at the time of CPA inclusion proving the thermal efficiency as required by the CDM methodology.
3	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.	The maximum number of ICS shall be defined for each CPA according to the specific ICS models distributed, and corresponding stove performance, to ensure a maximum energy saving of 180GWhth/year per CPA. In cases where the number of ICSs in any CPA exceeds the energy limit, the number of ERs shall be capped at those generated by ICSs saving in aggregate a maximum of 180GWhth per year. Any additional emission savings will either not be counted in the program or included in another CPA as appropriate. During the life of the SSC-PoA the number of CPAs implemented will increase and will be monitored according to the monitoring plan. CPAs under this SSC-PoA are not a de-bundled component of a large scale activity.
4	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.	Proof that non-renewable biomass has been used in the project region i.e. in host country Madagascar since 31 December 1989 is available through widespread documentation of more biomass being consumed than is sustainably harvested, and is specifically outlined in an information note for the CDM which estimates fraction of non-renewable biomass for Least Developed Countriea [5] . More specifically a survey report by WWF in

[5] CDM SSC WG 35th Meeting Report, Annex 20

		Madagasacr reveals that the 92% of total energy used by Malagasy households is met by wood biomass comes from forests[6]. Fuel wood and charcoal are the main sources of energy in both rural and urban areas. Wood Energy is mainly used as fuel for cooking at household. The FAO survey reveals that between 1990 and 2010, Madagascar lost an average of 56,950 hectare per year. In total, between 1990 and 2010, Madagascar lost 8.3% of its forest cover, or around 1,139,000 hectare[7]. The recent survey shows the deforestation rate is further increasing. Deforestation continues to rise in Madagascar with a forest loss rate of 1.5% per year from 2010 to 2013 (ONE, 2015). According to the National forest cover study, carried out by the National Office of Environment, Madagascar record a forest decline of 45000 ha on average for the year from 2010 to 2013, but currently it has increased to 135000 ha by 2015 (ONE, 2015). The above clearly shows that deforestation is evident and its happening since 1989 and trend is further increasing and above is mainly to meet woody biomass as fuel for meeting thermal energy requirement for cooking at households.
5	The use of this methodology in a project activity under a programme of activities is legitimate if the following leakages are estimated and accounted for, as required on a sample basis using a 90/30 precision for the selection of samples: a) Use of non-renewable woody biomass saved under the project activity to justify the baseline of other CDM project activities can also be a potential source of leakage. If this leakage assessment quantifies a portion of non-renewable woody biomass saved under the project activity that is then used as the baseline of other CDM project activities then $B_{old,i,j}$ is adjusted to account for the quantified leakage; b) Increase in the use of non-renewable woody biomass outside the project boundary to create non-renewable woody biomass baselines can also be a potential source of leakage. If this leakage assessment	The CME chooses to account for all leakage in the project activity by applying the adjustment factor of 0.95 to the $B_{old,i,j}$. For more details see specific CPA-DD.

[6] WWF, Diagnostic du secteur énergie à Madagascar, Report, September, 2012

[7] http://rainforests.mongabay.com/deforestation/2000/Madagascar.htm

	quantifies an increase in the use of non-renewable woody biomass outside the project boundary then $B_{old,i,j}$ is adjusted to account for the quantified leakage; c) As an alternative to subparagraphs (a) and (b) $B_{old,i,j}$ can be multiplied by a net to gross adjustment factor of 0.95 to account for both leakages, in which case surveys are not required.	

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

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14/11/2016

Tandavanala, Mr Manantsoa Tiana, manantsoa@tandavanala.org

Tandavanala is also a CME and CPA implimentor; please refer contact detail in Appendix-1

SECTION C. Management system

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The CME will manage PoA and hence will play a pivotal role in the development of CPAs and will oversee the inclusion of CPAs under the PoA. Through a technical review, the CME assesses the competence of potential CPA/CPA implementers to ensure that they fulfil technical and eligibility aspects of potential CPAs and to plan technical and administrative processes to meet PoA requirements.

The CME shall have the competencies to check the features of potential CPAs and ensure that each CPA meets all requirements and eligibility criteria before inclusion in the PoA. CME (Tandavanala) is a local registered NGO, working in forest management since last 15 years, have team of people having extensive experience in adaptation projects and have very good local network in host country Madagascar. Tandavanala will also utilise dedicated professionals having in depth knowledge and extensive capabilities in survey and sampling to get quality and relaiable data for emission reduction calculation for CPAs.

The management system is designed as per the Standard for Demonstration of Additionality, Development of Eligibility Criteria and Application of Multiple Methodologies for Programme of Activities (Version 04.0 EB 87 Annex 03), and includes all relevant information as per paragraph 21 therein.

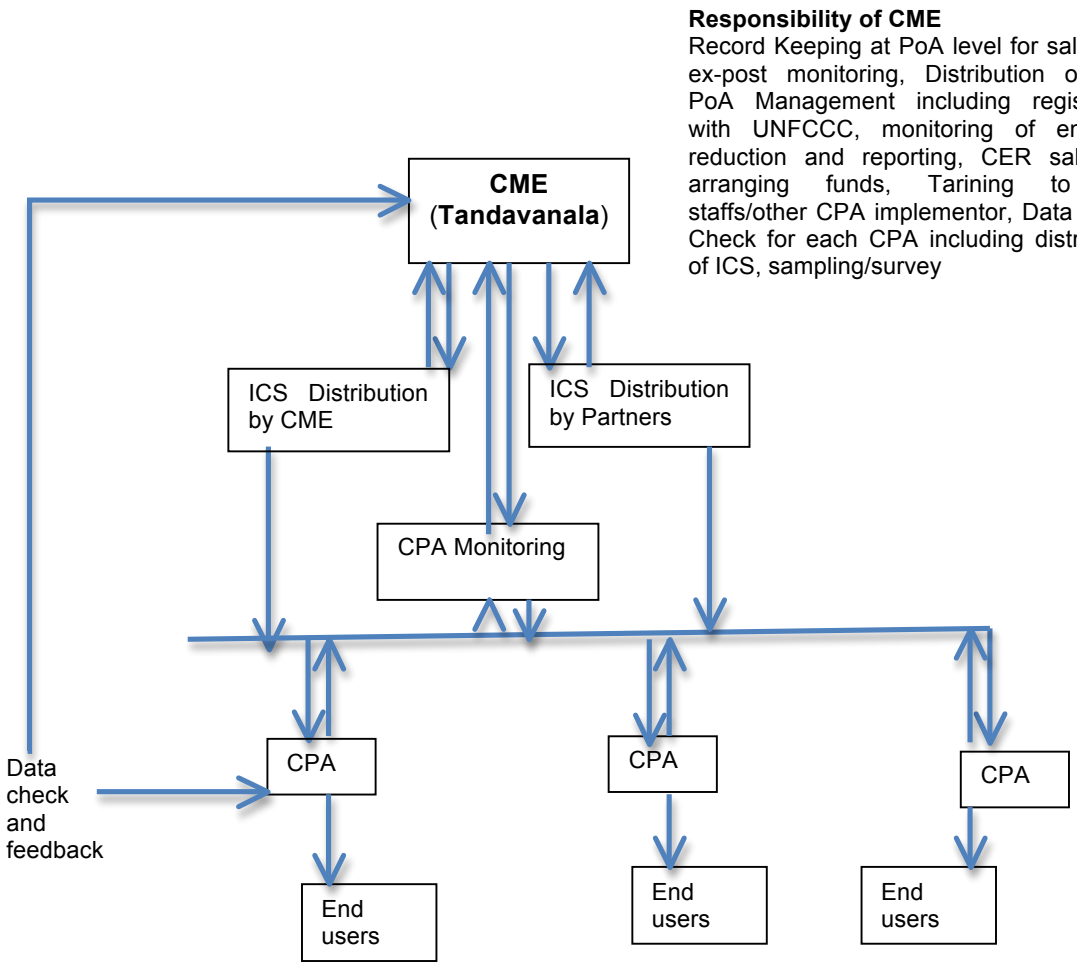
The following is the flow diagram and description of the operational and management arrangements established by the CME for the implementation of the PoA:

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

The CME is itself ICS manufacturer and will seek to develop partnerships with sub-Retailers and or other technology suppliers. All partners will be managed by the CME as shown in the diagram below.

The sales record including user information will be collected and recorded at the point of sale by the staff or Retailer. The information collected from the end-user will be transferred to an electronic database, which will be updated regularly. The sales record carries all the sales information including the traditional stove type (charcoal stove/firewood stove) used prior to ICS installation, name of chief of household, phone number, geo-coordinates etc. Likewise,

monitoring records are transferred from each monitoring organisation, if any, to the CME. The CME will ensure that appropriate records are maintained for each SSC-CPA.



Training, including that of field personnel, is needed to ensure monitoring activities are conducted effectively. This will include spot checking a random sample of homes with ICS to ensure the stoves are continuing to be used, as well as a random sample of homes selected for the stove efficiency tests (efficiency tests will be carried out by a third party or trained staff using the Water Boiling Test). The procedures to complete this sampling are described in Part II Section B.7.2 in line with EB 86 Annex 3 confidence/precision requirements.

If CPA implementer is other than CME, shall provide evidence of their ability to train technicians/instructors/field staff on ICS assembly, manufacture, installation and distribution in accordance with the type of stove implemented under its CPA.

(ii) Procedures for technical review of inclusion of CPAs under the PoA

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

CME will review each CPA document and methodically go through each and every eligibility/applicability criterion of the PoA to ensure the CPA meets each requirement with certainty. In cases where there is doubt, the CME will not upload the CPA document until the requirements are met to the CME's satisfaction. When new ICS models developed or selected, CME will get thermal efficiency test report based on WBT by third party lab to ensure that ICS meets minimum thermal efficiency requirement set by AMS II.G i.e. 20%.

CME will maintan/review database/registration procedures to ensure proper recording of the ICS data collection and management in line with the methodology and PoA eligibility criteria.

As the CPA is choosing to use a regional or local NRB analysis, CME will review the study completely to ensure it is as robust in method and data as the NRB study approved during the PoA validation. If there are any gaps or problems with the local NRB study, the CPA will not be uploaded for inclusion until the analysis is completed to the CME's satisfaction.

During implementation of the CPA, and as necessary, the CME personnel will make random visits in CPA region to ensure all procedures outlined in the PoA are being followed, particularly on stove registration and database updating.

(iii) Procedure to avoid double counting of ICS/CPA under the PoA

Each ICS in each SSC-CPA included in this PoA will be identified by a unique combination of Stove type, serial number and geographical location (e.g. THWXXXA). Quality control and quality assurance procedures will minimize any possible double counting. The serial number will start with an identifier "THW" for woody biomass stove and "THC" for charcoal stove, which will allow for a clear distinction between the stoves from Tandavavanala for this PoA with those of other potential PoAs. Each stove's serial number will be entered into a database that will clearly and unambiguously keep track of the unique stoves in each CPA. No individual serial number can be in more than one CPA, so it will not be possible for one stove to be counted in two different CPAs. In addition, each CPA will be cross-checked with other CPAs in this PoA and with CPAs in any other PoA or in a CDM project activity operating in the country using the UNFCCC, the Gold Standard, and other relevant voluntary carbon schemes to ensure that the CPA is not included in any other PoA, CDM project activity or voluntary carbon project activity. During each registration process of an ICS, the customer will acknowledge that they previously used a three-stone fire or traditional pot support and previously did not own any ICS in order to be included in the CPA. Registration data collected will be verified by spot-checks. This will ensure that no customers will be included in a new CPA if they already own an ICS.

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

A record keeping system for each CPA under the PoA will be established, wherein detailed information will be collected for each customer at the time of registration of the ICS, using either electronic or paper-based means, directly by the CPA implementer's field personnel or through partner organizations or independent distributers/retailers. This information will allow CPA implementers to track each individual ICS and/or household. The information collected by the CPA implementer (or partner organization, distributes/retailers, as appropriate) will be transferred to an electronic database, which will be maintained and updated by the CME regularly.

Each CPA's database will be identified with a cumulative maximum number of ICSs below the small-scale limit. Through the registration process, a customer will consent to an agreement that the household formerly used a wood predominantly on a three stone fire or traditional pot support and is willing to transfer rights to carbon assets created by the ICS to the CME (or any affiliate it so designates). This agreement will be a part of the registration process and the field personal will be responsible to make the customer understand before accepting the consent. In case a replacement stove is being issued to a customer already registered on the project database, a new registration will not be required. The replacement stove will be recorded in the project database in such a way that it is clear that the replaced stove ceases to be included in the CPA; and the replacement stove is associated with the customer's details as a new ICS, and is included in the CPA as a new ICS with a new serial number.

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

Each CPA included in the PoA is not a de-bundled component of another CDM programme activity (CPA) or CDM project activity. It will be ensured that 'If each of the independent subsystems/measures included in the CPA of a PoA is no larger than 1% of the small-scale thresholds defined by the methodology applied then that CPA of PoA is exempted from performing de-bundling check i.e., considering as not being a de-bundled component of a large scale activity.' The AMS II.G threshold is a maximum energy saving of 180 GWhrth/ year for SSC projects. The de-bundling rule does not apply to this SSC-PoA as the ICS (the independent subsystem) envisaged to be installed/distributed would not exceed 1% of the 180 GWhrth/ year SSC thresholds.

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

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

(vii) Measures for continuous improvements of the PoA management system.

The CME will undertake an annual review of the overall PoA management system, including identifying any problems with stove distribution/installation, stove use once in the homes, monitoring continued stove use and overall database maintenance. This review will ensure that best practices are maintained through the lifetime of the PoA.

SECTION D. Duration of PoA

D.1. Start date of PoA

>>

17/11/2016, date when the PoA-DD was published for the initial Global Stakeholder Consultation.

D.2. Duration of the PoA

>>

28 years

SECTION E. Environmental impacts

E.1. Level at which environmental analysis is undertaken

>>

Environmental analysis will be undertaken at PoA level. Since the distribution of ICS will have no considerable negative environmental impacts and impacts will be similar in all CPAs.

E.2. Analysis of the environmental impacts

>>

In accordance with Republic of Madagascar regulations, an EIA is not required for the distribution and implementation of ICS technology. The decree on the "Compatibility of Investments and Environment" (Decree 99.954 dated 15 December 1999) amended by Decree No 2004-167 of 03 February 2004 on the compatibility of investments with the environment (MECIE) determines which type of projects must execute an EIA and the necessary procedures. According to this decree the cook stove project does not fall into category mandated for conducting Environmental Impact Assessment.

SECTION F. Local stakeholder consultation

F.1. Solicitation of comments from local stakeholders

>>

A local stakeholder consultation was conducted on 31/10/2016 at office of Tandavanala from 11.30 AM to 1.30 PM. Stakeholders belonging to different groups had been invited to comment on the PoA by press release published on 21/10/2016 in newspaper and stakeholder also informed by the physical meeting. 19 people, representatives of the following groups, took part:

- Traditional stove users
- Users of an ICS
- Field assistants
- A charcoal stove user
- NGO representatives

The stakeholder consultation was conducted at PoA level, since the technology and its impacts will be similar in the entire PoA. The stakeholder consultation will however be repeated at CPA level as soon as:

- A CPAs is included applying another stove technology than the Tandavanala
- A CPA is implemented by another institution than the CME

F.2. Summary of comments received

>>

Participants commented and asked questions about the structure of the PoA, the role of carbon credits in funding, the expected price of the ICS; and about several features of the *TsinjoHarena* which was presented as ICS to be used in the first CPA, such as asking for life time and suggesting regular maintenance. It was also asked about whether *TsinjoHarena* can be operated with charcoal, suggesting using charcoal where woody biomass difficult to procure especially in urban areas. Moreover, participants asked what impacts the PoA would have on the local level, particularly regarding job creation. Apart from these direct questions, participants evaluated possible social and environmental impacts of the PoA.

F.3. Report on consideration of comments received

>>

All questions asked were answered by the CME. Since all comments were positive, no change of the PoA design is required.

SECTION G. Approval and authorization

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Letter of Approval from host country DNA was not available at the time of publishing PoA DD for initial Global Stakeholder Comments. The CME has achieved host country approval on 30/01/2017 with reference number 26-17/MEEF/SG/BNCCC/AND.

PART II. Generic component project activity (CPA)

SECTION A. General description of a generic CPA

There are two generic CPA considering distribution of ICS for woody biomass usage and ICS for charcoal usage. The first generic CPA below is for woddy biomass.

A.1. Purpose and general description of generic CPAs

>>

The main objective of this CPA is dissemination of the efficient improved cooking stove woody biomass based ICS to the rural household of Madagascar, which will result in reduced firewood consumption leading to climate change mitigation in a sustainable manner. Overall objectives are reduction of greenhouse gases, conservation of forests and woodlands as well as improved health conditions of ICS users due to improved indoor air quality.

The proposed CPA helps in acheiving following co-benefits, which will contribute in sustainable development in host country.

Environmental Well Being: as mentioned in section A.2 of PoA DD

Socio-economic Well Being: as mentioned in section A.2 of PoA DD

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

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

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This small scale CPA applies following methodology and tools:
Methodology: AMS-II.G. "Energy Efficiency Measures in Thermal Applications of Non-Renewable Biomass", Version 08.0

Sectoral Scope-03

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

>>

The methodology measures below constitute the justification for the choice of the selected methodology by showing that each CPA meets each applicability condition of the methodology.

S. No	CDM Methodology requirement	Project justification
1	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 (cook stoves or ovens or dryers) to replace the existing devices and/or energy efficiency improvements in existing biomass fired cook stoves or ovens or dryers	XXXXXXX
2	In the case of cook stoves, the methodology is applicable to introduction of single pot or multi pot portable or in-situ cook stoves with rated efficiency of at least 20 per cent.	XXXXXXX
3	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.	XXXXXX

4	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.	XXXXXXXXX
5	The use of this methodology in a project activity under a programme of activities is legitimate if the following leakages are estimated and accounted for, as required on a sample basis using a 90/30 precision for the selection of samples: a) Use of non-renewable woody biomass saved under the project activity to justify the baseline of other CDM project activities can also be a potential source of leakage. If this leakage assessment quantifies a portion of non-renewable woody biomass saved under the project activity that is then used as the baseline of other CDM project activities then $B_{old,i,j}$ is adjusted to account for the quantified leakage; b) Increase in the use of non-renewable woody biomass outside the project boundary to create non-renewable woody biomass baselines can also be a potential source of leakage. If this leakage assessment quantifies an increase in the use of non-renewable woody biomass outside the project boundary then $B_{old,i,j}$ is adjusted to account for the quantified leakage; c) As an alternative to subparagraphs (a) and (b) $B_{old,i,j}$ can be multiplied by a net to gross adjustment factor of 0.95 to account for both leakages, in which case surveys are not required.	XXXXXXX
6	To determine the value of the fraction of non-renewable biomass (fNRB) to be applied in a component project activity (CPA) of a POA, use one of the two options as follows: (a) Conduct local own studies to determine the local *f*NRB value (sub national values); or (b) Use default national values approved by the Board. The choice of which option to use shall be made ex ante. However, a switch from a national value of fNRB (i.e. option (b)) to sub-national values (i.e. option (a)) is permitted, under the condition that the selected approach is consistently applied to all CPAs.	XXXXXXX

B.3. Sources and GHGs

	Sources	Gas	Included?	Justification/Explanation
Baseline Scenario	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.
Project Scenario	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.

The project boundary of the SSC-CPA follows the definition in AMS II.G, Version 8.0. The project boundary is the physical, geographical area of the ICS that utilises biomass. The emissions sources to be included in, or excluded from, each SSC-CPA boundary in the CPAs are presented in the table above. The geographical bundary of CPA is same as of PoA.

B.4. Description of baseline scenario

>>

As per the AMS.II.G, it is assumed that in the absence of the project activity, the baseline scenario would be the use of fossil fuels for meeting similar thermal energy needs. As specified in the methodology, default value 81.6 tCO_2/TJ is used as the emission factor for the substitution of non-renewable biomass by similar consumers ($EF_{projected\_fossilfuel}$). Hence this default value will be used for baseline emission calculation for all CPAs.

B.5. Demonstration of eligibility for a generic CPA

>>

As per section B.2 of PoA DD part-I, the following criteria must fulfilled by each CPA to be included in the PoA.

S. No	**Eligibility Criteria**		**Evidence** (to be checked for CPA inclusion)
	Category	**Description**	
1	The geographical boundary of the CPA including any time-induced boundary consistent with the geographical boundary set in the PoA	The PoA boundary corresponds to the boundaries of host country Madagascar. All distributed ICS in each CPA shall be located within geographical boundary of Madagascar.	XXXXX
2	Conditions that avoid double counting of emission reductions like unique identification of product and end-user locations	A unique numbering system for ICS will be applied in each CPA, assigning a unique number to each ICS and allowing to clearly identify for each ICS to which CPA it belongs.	XXXXXXX
3	The specifications of technology/measure including the level and type of service, performance specifications including compliance with testing/certifications	CPAs under this PoA will consist in the distribution of ICS with a thermal efficiency of at least 20% to household users cooking with non-renewable biomass in the baseline scenario. The CPA consists of replacement of conventional firewood cook-stoves for	XXXXXXX

		biomass fired ICS as defined in the PoA-DD. Stove types replaced and implemented will be defined in the CPA-DD, and hence appliances involving the efficiency improvements in the thermal applications of non-renewable biomass as per AMS II. G.	
4	Conditions to check the start date of the CPA through documentary evidence	Any CPA start date shall not be before the PoA starting date i.e. date when PoA DD is published for Global Stakeholder Comments on UNFCCC.	XXXXXXXX
5	Conditions that ensure compliance with applicability and other requirements of single or multiple methodologies applied by CPAs	All CPA shall consist distribution of ICSs with efficiency improvements in thermal applications of non-renewable biomass; ICS shall have a thermal efficiency of at least 20%.	XXXXXXX
6	The conditions that ensure that the CPA meets the requirements pertaining to the demonstration of additionality	The additionality of the project activity is demonstrated by a barrier analysis that is in line with para 11 c) of EB 83, Annex 14, "Demonstration of additionality of small-scale project activities" (version 10)	XXXXXXXX
7	The PoA-specific requirements stipulated by the CME including any conditions related to undertaking local stakeholder consultations and environmental impact analysis	The local stakeholder consultation will be conducted at the PoA level (Section F of the PoA-DD). Each CPA will be implemented in similar social economic situations. The key stakeholders of the program both at PoA and CPA level are the same. An environmental impact analysis is not required (section E.2 of the PoA-DD). No further actions needed at the CPA level to satisfy the eligibility criteria.	XXXXXXX
8	Conditions to provide an affirmation that funding from Annex I Parties, if any, does not result in a diversion of official development assistance	The CME and the CPA operator (in case of being different from the CME) shall confirm that in case of public funding, there is no diversion of Official Development Assistance.	XXXXXXXX
9	Where applicable, target group (e.g. domestic/commercial/industria	Distribution mechanisms have been specified in the PoA-DD by means of the "General	XXXXXXX

	l, rural/urban, grid-connected/off-grid) and distribution mechanisms (e.g. direct installation)	operating and implementing framework of PoA" at the PoA level. The distribution mechanism is the direct distribution of ICS through the CME or regional partners.	
10	Where applicable, the conditions related to sampling requirements for the PoA in accordance with the "Standard for sampling and surveys for CDM project activities and programme of activities"	Monitoring of all CPAs will adhere to all requirements related to sampling for a PoA in accordance with the sampling standard including all annexes and amendments till EB 86 Annex 03.	XXXXXXX
11	Where applicable, the conditions that ensure that every CPA (in aggregate if it comprises of independent sub units) meets the small-scale or microscale threshold and remains within those thresholds throughout the crediting period of the CPA	The CPA shall remain under the applicable SSC limits for each component, which is 80 GWh/annum thermal energy savings (threshold as per clarification request SSC_233) for all ICS distributed under the CPA.	XXXXXXX
12	Where applicable, the requirements for the debundling check, in case the CPAs belongs to small-scale or microscale project categories.	If each of the independent subsystems/measures included in the CPA of a PoA is no larger than 1% of the small-scale thresholds defined by the methodologies applied, then the is exempted from performing de-bundling check (EB 83, Annex 13). 1% of SSC limits correspond to energy savings of 1.8 GWh	XXXXXXX
13	Approval of CPA by CME	The CME approves each CPA to be included into its registered PoA.	XXXXXX
14	CER ownership	End users receiving ICSs 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.	XXXXXX
15	Awareness and agreement of those operating a CPA on PoA subscription	Contractual provisions to ensure that those operating the CPA are aware and have agreed that their activity is being subscribed to the PoA.	XXXXXX

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

B.6.1. Explanation of methodological choices

>>

In accordance with para 14 of AMS II.G, version 08, it is assumed that in the absence of the project activity, the baseline scenario would be the use of fossil fuels for cooking.

The actual baseline scenario is the use of NRB. Since NRB has higher carbon intensity than the fossil fuels proposed in AMS II.G, this assumption reduces the emission reductions significantly, making the outcome more conservative.

The quantity of biomass used in absence of the project activity for target consumers will be determined at the CPA level. Assessments, information used in initial CPAs may be used in subsequent CPAs in lieu of conducting fresh assessments at each CPA level.

Emission reduction calculation

According to paragraph 15 of methodology AMS II.G, version 08, emission reductions would be calculated as

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

Where:

i = Indices for the situation where more than one type of project device is introduced to replace the pre-project devices

j = Indices for the situation where there is more than one batch of project device

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

$ER_{y,i,j,}$ = Emission reductions by project device of type *i and* batch *j* during year *y* in t CO_2e

LE_y = Leakage emissions in the year *y*

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

Where,

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

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

$f_{NRB,y}$ = Fraction of woody biomass that can be established as non- renewable biomass using survey methods or government data or default country specific fraction of non- renewable woody biomass (fNRB) values available on the CDM website

μ_y = Adjustment to account for any continued use of pre-project devices during the year *y* when applying equations 6 and 8 (fraction). Use 1.0 in other cases

$NCV_{biomass}$ = Net calorific value of the non-renewable woody biomass that is

substituted (IPCC default for wood fuel, 0.015 TJ/tonne, based on the gross weight of the wood that is 'air-dried')

$EF_{projected\_fossil\ fuel}$ = Emission factor for the fossil fuels projected to be used for substitution of non-renewable woody biomass by similar consumers. Use a value of 81.6 t CO_2/TJ

$N_{y,i,j}$ is monitored directly, for $NCV_{biomass}$ and $EF_{projected\_fossilfuel}$, the indicated default values are used, and LE_y is set to zero, since leakage is considered by multiplying $B_{y,savings,i,j}$ with net to gross adjustment factor of 0.95. μ_y is set to 365, following the final response of the SSC-WG on request 713, stating that It may be set to 1 (365/365) if the number of days for which the project stove's operation does not face any constraint. (Moreover, since ER are based on the woody biomass used in the project devices, which is monitored accurately anyways).
$B_{y,savings,i,j}$ and $f_{NRB,y}$ are determined as follows:

Determination of $B_{y,savings,i,j}$

In line with para 16 of applied approved methodology AMS II.G version08, four option given to determine $B_{y,saving,i,j}$. Here CME has chosen option third i.e. Water Boiling Test (WBT) with corresponding formula given below:

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

Where,

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

$\eta_{new,i,j}$ = Efficiency of the old devices being replaced by project devices of type *i* and batch *j*

$\eta_{old,i,j}$ = Efficiency of the project decive *i* and batch *j*

The calculations in the equations above assume that there is only one device per household. The above equation will be used for CPAs where only one stove per household is distributed. However, as initially CME is targetting to distribute the single pot ICS and to minimise time of cooking will also consider the distribution of 2 stoves per household.

Inline with para 22 of applied approved methodology AMS II.G version-08, in case 2 ICS is provided to household in project case, an adjusted formula shall be used.
For example, if 2 project devices are installed per household, 0.5 times the baseline woody biomass consumption per household ($B_{old,HH}$) is used as the total annual quantity of woody biomass that would have been used in the absence of the project activity in each device ($B_{old,i,j}$).

The baseline saving shall be determined as

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

$B_{old,HH} = B_{old,p} \times N_{p,HH}$

Where,

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

$N_{d,HH}$ = Number of project devices per household (number)

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

$N_{p,HH}$ = Average number of persons per household (number)

Determination of the Share of Non-Renewable Biomass

According to AMS II.G, para 30, equation 11, shall be used to calculate f_{NRB}:

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

Where:

$f_{NRB,y}$: fraction of non-renewable biomass (%)

NRB: non renewable biomass (tons)

DRB: Demonstrably renewable biomass (tons)

f_{NRB} will be calculated for each CPA by conducting subnational survey by third party.

Leakage

According to AMS-II.G the following potential sources of leakage have to be considered:

A) Use of NRB savings by non-project households

According to AMS-II.G para 32 the default net to gross adjustment factor of 0.95 is applied to account for leakage and therefore surveys are not required.

B) Transfer of Equipment

"If equipment currently being utilised is transferred from outside the boundary to the project activity, leakage is to be considered."

This leakage source can be ruled out since no used improved cookstoves will be transferred or deployed from outside the geographical project boundary to the project activity.

B.6.2. Data and parameters fixed ex-ante

>>

Data / Parameter:	**$B_{old,i,j}$**
Data unit:	tonne/year
Description:	Annual quantity of woody biomass that would have been used in the absence of the project activity to generate useful thermal energy equivalent to that provided by the project device type *i* and batch *j*
Source of data:	Historical data or survey of local usage will be conducted for each target consumer group included in a given CPA
Value(s) applied:	XXX
Choice of data or Measurement methods and procedures:	Established in CPA-DD. Combination of literature and/or field survey by a dedicated expert team.

Purpose of data	Calculation of Baseline Emissions
Additional comment:	Assessments, information and results established in initial CPAs may be used in subsequent CPAs in lieu of conducting fresh assessments at each CPA level in absence of new data. Further as CME plans distribution of only one ICS per households hence $B_{old,i,i}$ equals $B_{old,HH}$

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 useful thermal energy equivalent to that provided by the project devices
Source of data:	Historical data or survey of local usage will be conducted for each target consumer group included in a given CPA
Value(s) applied:	XXX
Choice of data or Measurement methods and procedures:	Established in CPA-DD. Combination of literature and/or field survey by a dedicated expert team.
Purpose of data	Baseline emission calculation
Additional comment:	The value will be fixed ex-ante

Data / Parameter:	**$N_{P,HH}$**
Data unit:	Number
Description:	Average number of persons served per household prior to project implementation
Source of data:	Established ex-ante based on literature and/or field survey by a dedicated expert team.
Value(s) applied:	6
Choice of data or Measurement methods and procedures:	The value is chosen based on published report
Purpose of data	Baseline emission calculation
Additional comment:	The value is fixed ex-ante

Data / Parameter:	**η_{old}**
Data unit:	%
Description:	Efficiency of the system being replaced (Traditional Cooking Stoves)
Source of data:	Default value as per applied methodology AMS II.G version 08
Value(s) applied:	10
Choice of data or Measurement methods and procedures:	The default value of 0.10 is used as the replaced system is a three stone fire, or a conventional device with no improved combustion air supply or flue gas ventilation, i.e. without a grate or a chimney.
Purpose of data	Calculation of Quantity of woody biomass that is saved in tonnes per device
Additional comment:	The value is fixed ex-ante

Data / Parameter:	**$NCV_{biomass}$**
Data unit:	TJ/tonne
Description:	Net calorific value of the non-renewable woody biomass that is substituted

Source of data:	Default value as per applied methodology AMS II.G version 08
Value(s) applied:	0.015
Choice of data or Measurement methods and procedures:	Default value as per applied methodology AMS II.G version 08
Purpose of data	For calculation of emission reduction
Additional comment:	The value is fixed ex-ante

Data / Parameter:	$EF_{projected\_fossilfuel}$
Data unit:	tCO_2/TJ
Description:	Emission factor for the substitution of non-renewable woody biomass by similar consumers
Source of data:	Default value as per applied methodology AMS II.G version 08
Value(s) applied:	81.6
Choice of data or Measurement methods and procedures:	This value represents the emission factor of the substitution fuels likely to be used by similar users, on a weighted average basis. It is assumed that the mix of present and future fuels used would consist of a solid fossil fuel (lowest in the ladder of fuel choices), a liquid fossil fuel (represents a progression over solid fuel in the ladder of fuel use choices) and a gaseous fuel (represents a progression over liquid fuel in the ladder of fuel use choices). Thus a 50% weight is assigned to coal as the alternative solid fossil fuel (96 tCO2/TJ) and a 25% weight is assigned to both liquid and gaseous fuels (71.5 tCO2/TJ for Kerosene and 63.0 tCO2/TJ for Liquefied Petroleum Gas (LPG).
Purpose of data	For calculation of emission reduction
Additional comment:	The value is fixed ex-ante

Data / Parameter:	L_Y
Data unit:	Fraction
Description:	Leakage adjustment factor
Source of data:	Default value as per applied methodology AMS II.G version 08
Value(s) applied:	0.95
Choice of data or Measurement methods and procedures:	As per the methodology AMS II.G/v06, *Bold* can be multiplied by a net to gross adjustment factor of 0.95 to account for leakages, in which case surveys are not required.
Purpose of data	For calculation of emission reduction
Additional comment:	The value is fixed ex-ante

Data / Parameter:	μ_Y
Data unit:	--
Description:	Number of days of utilization of the ICS during the year '*y*'.
Source of data:	As per applied methodology AMS II.G version 08 and final response of the SSC WG on request 713.
Value(s) applied:	365

Choice of data or Measurement methods and procedures:	μ_y is set to 365, following the final response of the SSC-WG on request 713, stating that it may be set to 1 (365/365) if the number of days for which project stoves operation does not face any constraint. In the case where the efficient project stove was operated only for a part of the year due to logistics of the stove distribution during the initial phase of the project implementation, as also mentioned in final response of the SSC- WG on request 713, the provisions for monitoring of parameter $\boldsymbol{N_{y,i,j}}$ in section B.7.1 guarantee that only the real operation time is considered.
Purpose of data	For calculation of baseline emission
Additional comment:	The value is fixed ex-ante

Data / Parameter:	**$f_{NRB,y}$**
Data unit:	Fraction
Description:	Fraction of woody biomass saved by the project activity during year *y* that can be established as non-renewable biomass
Source of data:	Sub national survey report conducted by third party expert
Value(s) applied:	XXX
Choice of data or Measurement methods and procedures:	The value will taken from survey report conducted for specific CPA(s) and will be fixed ex-ante.
Purpose of data	For calculation of baseline emission
Additional comment:	The value is fixed ex-ante

Data / Parameter:	**Life span**
Data unit:	Number of years
Description:	The operating life time of the project device.
Source of data:	Lab test report
Value(s) applied:	XXX
Choice of data or Measurement methods and procedures:	The value will taken from third party test report conducted for specific ICS type and will be fixed ex-ante. The loss in efficiency should be applied as default value 2% per year as per para 25 a) of AMS II.G version-08.
Purpose of data	For calculation of baseline emission
Additional comment:	The value is fixed ex-ante

B.6.3. Ex-ante calculations of emission reductions

>>

Emission reductions for each SSC-CPA will be calculated according to the following formula: The sample calculation below is shown for single pot ICS, considering 1&2 ICS per household.

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

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 (assumed 94%)

$NCV_{biomass}$= Net calorific value of the non-renewable woody biomass that is substituted (IPCC default for wood fuel, 0.015 TJ/tonne, based on the gross weight of the wood that is 'air-dried')

$EF_{projected\_fossil\ fuel}$ = Emission factor for the fossil fuels projected to be used for substitution of non-renewable woody biomass by similar consumers. Use a value of 81.6 t CO_2/TJ

Further,

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

Where

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 (4.471 Tonne/year)*

$\eta_{new,i,j}$ = Efficiency of the old devices being replaced by project devices of type *i* (31.1%)

$\eta_{old,i,j}$ = Efficiency of the project decive *i (10%)*

1. For example considering one IC stove per household, the number of IC stoves will be 14271 the saving is calcualted as

$B_{y,saving,i,j}$ = 4.471 x [1- (10%/31.1%)

$B_{y,saving,i,j}$ = 3.033 tonne wood/per year/per stove

Adjusting leakage factor

$B_{y,saving,i,j}$ = 3.033 x0.95 tonne wood/per year/per stove

$B_{y,saving,i,j}$ =2.881 tonne wood/per year/per stove

Hence

ER_y = 2.881 x 14271 x 0.94 x 0.015 x 81.6

ER_y = 47316 tCO_2e/year

2. For example considering 2 IC stove per household, the number of IC stoves will be 28553 the saving is calcualted as

$B_{y,saving,i,j}$ =2.881x0.5 (in line with para 22 of AMS II.G version-08)

$B_{y,saving,i,j}$ =2.235 tonne wood/per year/per stove

Hence

ER_y = 2.235 x 28553 x 0.94 x 0.015 x 81.6

ER_y = 47316 tCO_2e/year

B.7. Application of the monitoring methodology and description of the monitoring plan

B.7.1. Data and parameters to be monitored by each generic CPA

Data / Parameter:	**$N_{y,i,j}$**
Data unit:	Number
Description:	Number of project devices of type *i* and batch *j* operating during year *y*
Source of data:	Stove sales database and Survey records
Value(s) applied	XXX

Measurement methods and procedures:	The total number of appliances by type and age deployed during period y is tracked in the Project Database of the specific CPA, which is updated regularly. All appliances distributed will be recorded for installation date and recipient / location. The sales date for each appliance listed in the Project Database of each CPA signifies the start of operation for each appliance type. *Sampling Frame:* Project Database of each CPA (or combined PoA database in case of PoA level sampling) as defined by sales date, appliance type, serial number, and end-user information. *Sample Size and Desired Precision:* see PoA-DD, Part II, Section B.7.2. *Sample Method:* see PoA-DD, Part II, Section B.7.2. 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 project implementer (if different than CME) shall maintain a sales record to calculate this parameter. The CME supervises the activities of each CPA implementor (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. Also, if at the CPA-level it is assumed ex-ante that there is only one project stove being used per household for calculating $B_{old,i}$, then, ex-post sampling based monitoring shall also include assessment of presence of multiple operational project stoves in a sampled household. The number of project stoves in the CPA shall be adjusted accordingly to claim emissions reduction only for one operational project stove per household to ensure equivalence with the baseline established.

Data / Parameter:	$\eta_{new,i,j}$
Data unit:	%
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 report conducted by an independent third party during the annual ICS users' survey
Value(s) applied	XXX
Measurement methods and procedures:	For each types of ICS disseminated under the programme. Separate Water Boiling Test will be carried out for these ICS using standard testing protocol. The efficiency test will be carried out for different types and models of ICS. The value obtained from the test will be used to calculate the emission reductions of the systems for that year of operation. Sample for this survey will be drawn as per the "Guidelines for sampling and surveys for CDM project activities and programme of activities
Monitoring frequency:	(i) Recorded at the time of commissioning/distribution (ii) Adjusted for the loss of efficiency as 2% per annum as per para 25 a) of AMS II.G. version-08.

QA/QC procedures:	The test will be carried out once every year by an independent third party. As required by AMS II.G for annual surveys, the margin of error 10% and a confidence interval of 90% will be ensured for the monitoring the efficiency of stoves.
Purpose of data	The monitored value of this parameter will be used in the determination of the ex-post emission reduction for all CPAs.
Additional comment:	If any sample stove is found to be operating below the 20% efficiency, the proportionate number of stoves of that type included in the CPA will be considered to be non-operational and not accounted for ER calculation.

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 record of ICS
Value(s) applied	XXX
Measurement methods and procedures:	For each batch the date of distribution of first ICS will be recorded and used as date of commissioning for that batch.
Monitoring frequency:	Recorded at the time of commissioning/distribution of first ICS of the batch
QA/QC procedures:	NA
Purpose of data	Start date
Additional comment:	The record to be kept for crediting period + 2 years

Data / Parameter:	**$N_{d,HH}$**
Data unit:	Number
Description:	Number of project devices distributed per household
Source of data:	Sales record of ICS
Value(s) applied	XXX
Measurement methods and procedures:	Recorded at the time of commissioning/distribution of project devices and it can be crosschecked with user details having number of ICS.
Monitoring frequency:	Recorded at the time of commissioning/distribution of ICS
QA/QC procedures:	The proecure will be developed in electronic system to record number of ICS provided to particular household in any CPA
Purpose of data	To calculate baseline emission
Additional comment:	The record to be kept for crediting period + 2 years

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

The Monitoring Plan applied in this PoA involves a number of key elements that ensure that the CME have high-quality, unbiased and reliable information regarding the performance of the project in terms of implementation and outcomes, and for the purposes of calculating Certified Emission Reductions (CERs) following AMS II.G version 8.0 on the basis of the amount of non-renewable biomass saved by the ICS in the project activity. The key elements are the following:

- Project database management
- Spot Checks of ICS
- Sample Plan for the Monitoring Survey
- Data Quality, Consistency and Duplication Checks
- Monitoring Reporting

Project Database Management:
The information collected by the CME/CPA implementer will be stored in the electronic database available with CME and it will be updated on ongoing basis by trained staff. The database will be sortable by the information collected as per Registration process and will be made available to the DOE at verification. The CME/CPA implementer will verify accuracy and completeness and confirm that there is no double entry of serial numbers in the database. The CPA implementer will identify any discrepancy and the correct information will be entered into the database.

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

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

All technical staff responsible for installation and maintenance of the stoves will be trained in terms of the understanding the requirements of CDM on the monitoring system. The technical, operational and maintenance trainings provided for the personnel will be described in each monitoring report.

Spot Checks of ICS Installed:
Trained field staff will continually randomly select households included in the database and visit them to cross-check the information on the database with the factual evidence in the field. Any inconsistencies found (eg. change in the address of a user) will be updated on the database, and in the case ICS are found to be no longer in use, they will be clearly marked as such and excluded from emission reductions calculations.

Sample Plan:
The monitoring plan is designed to monitor the parameters listed in Section B.7.1, which are required for calculation of the actual GHG emission reduction achieved by the CPA using ex post sampling survey. The share of operating stoves and their efficiency will be determined based on sampling procedures as outlined below. The CME will be responsible for conducting the sampling surveys and maintaining a database with all operating stoves.

No monitoring for leakage through competitive uses of biomass is required, as the parameter ER calculations are discounted for that by deducting 5% (by factoring the estimated ERs by 95%).

As per the Standard for Sampling and Surveys for CDM Project Activities and Programme of Activities, version 05.0, the sampling plan is the following:

(a) Sampling Design
Due to the large number of ICS envisioned to be distributed as part of the CPAs to be included in the PoA, it is not economically feasible to monitor each individual ICS unit distributed. Therefore, representative sampling will be undertaken as part of a PoA-wide Sampling Plan (by grouping and sampling across CPAs) that is designed in line with the requirements of the "Standard for sampling and surveys for CDM project activities and programme of activities", version 05.0.

(i) Objective and Reliability Requirements:

The objective is to obtain an unbiased and reliable estimate of the proportion or mean value of the following key variables over the course of the crediting period, and with 95/10 confidence/precision (as per paragraph 21 of EB 86 Annex 3) for annual and 95/5 for biennial sampling across CPAs (as per Methodology AMS-II.G version 08). In case a single CPA is sampled 90/10 confidence/precision for annual and 95/5 confidence/precision shall be required for biennial sampling.

Monitored Parameter:

$N_{y,i,j}$	Proportion of ICS still in operation
$\eta_{new,i,j}$	Thermal Efficiency of operational ICS

(ii) Target Populations:

- The target population for the proportion of ICS still in operation ($N_{y,i,j}$) of this POA are all households in the POA database which are using fuel wood in ICS distributed under the POA for cooking.
- The target population for efficiency of new appliances ($\eta_{new,i,j}$) is the set of stoves (same model and manufacturer) installed in vintage i across CPAs that are working and are in the database.

(iii) Sampling Frame

To ensure the homogeneity of the CPAs included for a single sampling plan, two sampling frames shall be defined. Overall, all CPAs will have same group of end users which is from rural area. The CPAs are to be implemented in rural area, thus it is expected that the geographical locations do not have influence on the parameter of interest. Therefore all above mentioned parameters can be assumed to be highly homogeneous for each ICS model regardless of how the end user group and distribution/installation location is defined.

1) Sampling frame for proportion of ICS still 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 “Standard for Sampling and Surveys for CDM Project Activities and Programme of Activities”, version 05.0.

The POA is open to different CPA Implementers and different models of ICS. 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 3, section 5, paragraph 21, footnote 20, for the use of a single sampling plan covering a group of CPAs, provided the homogeneity of population can be demonstrated, or differences are taken into account in the sample size calculation, a 95/10 confidence/precision is applied for annual sampling. As per Methodology AMS-II.G version 08 para 40, a 95/5 confidence/precision shall be achieved for biennial sampling. In case a single CPA is sampled, 90/10 confidence/precision for annual and 95/5 confidence/precision shall be required for biennial sampling.

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 model

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) Thermal Efficiency of operational ICS ($\eta_{new,i,j}$)
In line with para 41 of applied approved methodology AMS II.G version 08, *Efficiency of devices may be monitored in a common survey with other monitoring parameters; therefore, a random sub-sample within the common survey can be taken for which stove efficiency is tested, as long as the required precision for stove efficiency is achieved*.

The thermal efficiency of operational ICSs shall vary in accordance with its model, but not within different CPA Implementers. Hence for parameter $\eta_{new,i,j}$ the Primary Sampling Unit shall be defined as the group of ICSs of the same model and same vintage. If the same CPA Implementer has two different ICS models being implemented in the same vintage – this will form two Primary Sampling Units. Finally, two primary sampling units will be formed by ICS from two different vintages and all other factors (ICS model and CPA Implementer) remaining equal. The below schematics illustrate the example used above assuming all stoves in the schematic are in one vintage.

For example, if different CPA Implementers are implementing CPAs using an ICS model "Y" for the past 3 years. In order to evaluate the thermal efficiency of the different vintages of the same stove "Y", the primary group shall consist of all ICSs implemented in different CPAs under the POA (regardless of CPA Implementer) which are of the same vintage and same model – in this example there are three primary sampling units which are: 1) ICSs of Model Y and vintage 1 (less than one year in operation); 2) ICSs of Model Y and vintage 2 (between one and two years of operation); and 3) ICSs of Model Y and vintage 3 (between two and three years old in operation).

(iv) Sampling Method
The sampling method for monitored parameters $N_{y,i,j}$ and $\eta_{new,i,j}$ is Simple 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.

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)
$\eta_{new,i,j}$: ICS will be tested using WBTs (ICS thermal efficiency) The efficiency of ICS ($\eta_{new,i,j}$) as determined by the water boiling test evaluated during the monitoring period.

The efficiency of ICS will be determined across CPAs using the same stove model and same vintage (Primary Sample Unit). Using the formulas in the section "Sample Size" below, the CME will randomly sample the required number of ICS from the primary sampling units. It is important to note that $\eta_{new,i,j}$ and hence the thermal efficiency test must take into consideration and be conducted for each ICS vintage.

As an illustrative example, consider a PoA that distributed a single ICS manufacturer/model but had two vintages: 75% of the total ICS distributed have been in use for less than 365 days

(ie. vintage 1) and 25% have been in operation for over 365 days but less than 730 days (ie. vintage 2). In this case, 2 Primary Sampling Units shall be formed with each sampling unit represents one vintage. For each vintage, a number of ICSs are to be randomly selected and sampled and the sample sizes are to be determined using the below equations. The mean thermal efficiency of each vintage shall be used for calculating emission reductions for all stoves of vintage i. Ie. if $\eta_{new,i,j}$ for stoves of vintage 1 is 26% and for vintage 2 is 24%, then all ICS which have been in use for less than a year (vintage 1) will use a thermal efficiency of 26% in its calculations, while stoves vintage 2 will use 24%. In the event the monitoring period is over one year (let's use the example of 2 years) and an ICS has began its operation on the first day of the monitoring period, the stove shall apply the equivalent number of days in operation under vintage 1 and the equivalent number of days of operation under vintage 2. For avoidance of doubt, in every monitoring period, all ICS vintages will be sampled and the thermal efficiency for each vintage shall be established and used for the calculation of emission reductions for that monitoring period.

(v) Sample Size

For the estimation of the proportion or mean value of the parameters investigated, the minimum sample size for each sample frame has to achieve the 95/10 confidence/precision for annual and 95/5 confidence/precision for biennial sampling. In case a single CPA is sampled, a 90/10 confidence/precision is required for annual sampling and 95/5 confidence/precision shall be required for biennial sampling.

The procedure to determine the sample of households will ensure that they adequately represent the broader project population, minimizing sampling error. Using, a 95 per cent confidence level, and a 10 per cent margin of error, random samples will be selected from each Primary Sampling Unit. There are two parameters that will be estimated through sampling: the number of stoves still in operation during the monitoring period as determined by the monitoring survey ($N_{y,i,j}$), and the average ICS efficiency, ($\eta_{new,i,j}$). In line with para 41 of AMS II.G version 08, both can be be sampled in a single survey with a random sample of households using the above described confidence/precision levels depending on annual or biennial monitoring frequency. The $N_{y,i,j}$ requires proportion/percentage parameters while $\eta_{new,i,j}$ is a mean value parameter.

In order to calculate the required sample size estimates, values for the proportions, mean values, and standard deviations are required. As per Guidelines for Sampling and surveys for CDM project activities and programmes of activities, version 04.0 Appendix 1 paragraph 5, there are different ways available to obtain the estimates of the parameter of interest:

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

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

To estimate the sample size for parameters $N_{y,i,j}$ the following equation is used:

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

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

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

The CME envisage distribution of 600,000 ICSs over next five year. Hence, population size, N, is taken as 600,000 households/ICS (Assuming one ICS for one household).

It is expected at least 90% of ICS will be operational, hence the expected proportion p for $N_{y,i,j}$ is taken as 0.9.

The expected mean of ICS thermal efficiency is 0.26 and its standard deviation is 0.05 for $\eta_{new,i,j}$.

Sample size calculation:
The calculation of the required sample size for each parameter in the first monitoring period is illustrated below for a 95/10 level of confidence and precision (for biennial monitoring periods the sample sizes will be recalculated using 95/5 confidence/precision values). In all cases a conservative approach is taken, however if for any parameter the required 95/10 confidence/precision is not met then the CME will randomly select an additional sample and collect further data from this sample to ensure the pooled data meet or exceed the required thresholds.

Parameter $N_{y,i,j}$: Based on the above assumptions, the resulting sampling size for a 95/10 confidence/precision is calculated as:

$$n \geq \frac{1.96^2 \times 600{,}000 \times 0.9\,(1-0.9)}{(600{,}000 - 1) \times 0.1^2 \times 0.9^2 + 1.96^2 \times 0.9\,(1-0.9)}$$

Which comes out to be

$n \geq 42.68$
$n = 43$

Therefore, in this case a sample size of 43 is to be sampled from each primary sampling unit.

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

Parameter $\eta_{new,i,j}$:
For the purposes of determining sample size in the first monitoring period, the performance of ICS can be categorized into two groups, which are characterized by the range of likely mean efficiency and the likely values of SD relative to the mean, according to the type of ICS. The ICS models that are manufactured in modern factories tend to be very highly efficient (30-50% thermal efficiency) and have been designed to meet stringent efficiency specifications so the standard deviation is expected to be relatively low. Where key components of ICS (e.g. the combustion chamber and flue) are not manufactured but instead are installed on-site or handmade, then the mean efficiency is expected to be in the range of 20-30% with relatively higher variability.

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

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

Where,

$V = (SD/mean)^2$
n = Sample size
N = Population size (Total number of households/ICS)
Mean= Expected mean of ICS thermal efficiency
SD = Expected standard deviation
1.96 = Represents the 95% confidence required
(In the case of 90% confidence, 1.645 shall be used)
0.1 = Represents the 10% relative precision

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

$$n \geq \frac{1.96^2 \times 600{,}000 \times (0.05/0.26)^2}{(600{,}000-1) \times 0.1^2 + 1.96^2 \times (0.05/0.26)}$$

Using above values the sample size comes out to be 14.20 or 15.

If the resulting sample size based on the above equation is smaller than 30, since $\eta_{new,i,j}$ is a numeric mean value (i.e. not a proportion or percentage) then Student's t-distribution shall be used as per paragraph 13 of "Standard for Sampling and Surveys for CDM Project Activities and Programme of Activities, version 05.0.

The sample size for parameter $\eta_{new,i,j}$ under t-distribution is referred to the equation below:

$n = (t_{n-1} \times SD/0.1x \text{ mean})^2$

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

$n = (1.96 \times 0.05/0.1x\ 0.26)^2$

n= 14.20

Thus n is rounded up to 15.

The calculation now need to repeat using t-value for 95% confidence and n = 15

$n = (2.131 \times 0.05/0.1x\ 0.26)^2$

n= 16.79 and rounded to n=17.

The calculation now need to repeat using t_{n-1} value for n = 17. The process should be iterated until there is no change to the value of n.

The repeated calculation shows that n = 16. Thus the sample size to be sampled from each sampling unit is 16.

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

The CME may choose to use the same samples to monitor more than one parameter, where parameters have same units. Sampling more than one parameter within the same sample (household) helps reduce travel needs for monitoring and the associated costs. At the same time this approach ensures the random selection of samples for every parameter.
Oversampling is strongly encouraged, not only to compensate for any attrition, outliers or non-response associated with the sample, but also to prevent a situation at the analysis stage where the required reliability is not achieved and additional sampling efforts would be required. The sample size shown above will be adjusted upwards to account for non-responses, CME shall determine the appropriate non-responses rate based on previous experience.

PART II. Generic component project activity (CPA)

SECTION A. General description of a generic CPA

The below generic CPA is for ICS replacing charcoal stoves in baseline

A.1. Purpose and general description of generic CPAs

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The main objective of this CPA is dissemination of the efficient improved cooking stove charcoal based ICS to the village/semi-urban household in rural area of Madagascar, which will result in reduced charcoal consumption, thereby resulting less non-renewable biomass consumption for charcoal production leading to climate change mitigation in a sustainable manner. Overall objectives are reduction of greenhouse gases, conservation of forests and woodlands as well as improved health conditions of ICS users due to improved indoor air quality.

The proposed CPA helps in acheiving following co-benefits, which will contribute in sustainable development in host country.

Environmental Well Being: as mentioned in section A.2 of PoA DD

Socio-economic Well Being: as mentioned in section A.2 of PoA DD

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

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

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This small scale CPA applies following methodology and tools:
Methodology: AMS-II.G. "Energy Efficiency Measures in Thermal Applications of Non-Renewable Biomass", Version 08.0

Sectoral Scope-03

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

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The methodology measures below constitute the justification for the choice of the selected methodology by showing that each CPA meets each applicability condition of the methodology.

S. No	CDM Methodology requirement	Project justification
1	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 (cook stoves or ovens or dryers) to replace the existing devices and/or energy efficiency improvements in existing biomass fired cook stoves or	XXXXXX

	ovens or dryers	
2	In the case of cook stoves, the methodology is applicable to introduction of single pot or multi pot portable or in-situ cook stoves with rated efficiency of at least 20 per cent.	XXXXXXXX
3	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.	XXXXXXX
4	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.	XXXXXXXX
5	The use of this methodology in a project activity under a programme of activities is legitimate if the following leakages are estimated and accounted for, as required on a sample basis using a 90/30 precision for the selection of samples: a) Use of non-renewable woody biomass saved under the project activity to justify the baseline of other CDM project activities can also be a potential source of leakage. If this leakage assessment quantifies a portion of non-renewable woody biomass saved under the project activity that is then used as the baseline of other CDM project activities then $B_{old,i,j}$ is adjusted to account for the quantified leakage; b) Increase in the use of non-renewable woody biomass outside the project boundary to create non-renewable woody biomass baselines can also be a potential source of leakage. If this leakage assessment quantifies an increase in the use of non- renewable woody biomass outside the project boundary then $B_{old,i,j}$ is adjusted to account for the quantified leakage; c) As an alternative to subparagraphs (a) and (b) $B_{old,i,j}$ can be multiplied by a net to gross adjustment factor of 0.95 to account for both leakages, in which case surveys are not required.	XXXXXXX
6	To determine the value of the fraction of non-renewable biomass (fNRB) to be applied in a component project activity (CPA) of a POA, use one of the two options as follows: (c) Conduct local own studies to determine the local fNRB value (sub	XXXXXXXX

	national values); or (d) Use default national values approved by the Board. The choice of which option to use shall be made ex ante. However, a switch from a national value of fNRB (i.e. option (b)) to sub-national values (i.e. option (a)) is permitted, under the condition that the selected approach is consistently applied to all CPAs.	

B.3. Sources and GHGs

	Sources	Gas	Included?	Justification/Explanation
Baseline Scenario	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 Scenario	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.

The project boundary of the SSC-CPA follows the definition in AMS II.G, Version 8.0. The project boundary is the physical, geographical area of the ICS that utilises biomass. The emissions sources to be included in, or excluded from, each SSC-CPA boundary in the CPAs are presented in the table above. The geographical bundary of CPA is same as of PoA.

B.4. Description of baseline scenario

>>

As per the AMS.II.G, it is assumed that in the absence of the project activity, the baseline scenario would be the use of fossil fuels for meeting similar thermal energy needs. As specified in the methodology, default value 81.6 tCO_2/TJ is used as the emission factor for the substitution of non-renewable biomass by similar consumers ($EF_{projected\_fossilfuel}$). Hence this default value will be used for baseline emission calculation for all CPAs.

B.5. Demonstration of eligibility for a generic CPA

>>

As per section B.2 of PoA DD part-I, the following criteria must fulfilled by each CPA to be included in the PoA.

S. No	Eligibility Criteria		Evidence (to be checked for CPA inclusion)
	Category	Description	
1	The geographical boundary of the CPA including any time-	The PoA boundary corresponds to the boundaries	XXXXXXXXX

	induced boundary consistent with the geographical boundary set in the PoA	of host country Madagascar. All distributed ICS in each CPA shall be located within geographical boundary of Madagascar.	
2	Conditions that avoid double counting of emission reductions like unique identification of product and end-user locations	A unique numbering system for ICS will be applied in each CPA, assigning a unique number to each ICS and allowing to clearly identify for each ICS to which CPA it belongs.	XXXXXXX
3	The specifications of technology/measure including the level and type of service, performance specifications including compliance with testing/certifications	CPAs under this PoA will consist in the distribution of ICS with a thermal efficiency of at least 20% to household users cooking with charcoal in the baseline scenario. The CPA consists of replacement of conventional charcoal cook-stoves for charcoal fired ICS as defined in the PoA-DD. However as charcoal is mainly produced in host country from non-renewable biomass, hence will lead in saving of NRB. Stove types replaced and implemented will be defined in the CPA-DD, and hence appliances involving the efficiency improvements in the thermal applications of non-renewable biomass as per AMS II. G.	XXXXXXX
4	Conditions to check the start date of the CPA through documentary evidence	Any CPA start date shall not be before the PoA starting date i.e. date when PoA DD is published for Global Stakeholder Comments on UNFCCC.	XXXXXXX
5	Conditions that ensure compliance with applicability and other requirements of single or multiple methodologies applied by CPAs	All CPA shall consist distribution of ICSs with efficiency improvements in thermal applications of non-renewable biomass; ICS shall have a thermal efficiency of at least 20%.	XXXXXXXX
6	The conditions that ensure that the CPA meets the requirements pertaining to the demonstration of additionality	The additionality of the project activity is demonstrated by a barrier analysis that is in line with para 11 c) of EB 83, Annex 14, “Demonstration of additionality of small-scale project activities” (version 10)	XXXXXX
7	The PoA-specific	The local stakeholder	XXXXXX

	requirements stipulated by the CME including any conditions related to undertaking local stakeholder consultations and environmental impact analysis	consultation will be conducted at the PoA level (Section F of the PoA-DD). Each CPA will be implemented in similar social economic situations. The key stakeholders of the program both at PoA and CPA level are the same. An environmental impact analysis is not required (section E.2 of the PoA-DD). No further actions needed at the CPA level to satisfy the eligibility criteria.	
8	Conditions to provide an affirmation that funding from Annex I Parties, if any, does not result in a diversion of official development assistance	The CME and the CPA operator (in case of being different from the CME) shall confirm that in case of public funding, there is no diversion of Official Development Assistance.	XXXXXXX
9	Where applicable, target group (e.g. domestic/commercial/industrial, rural/urban, grid-connected/off-grid) and distribution mechanisms (e.g. direct installation)	Distribution mechanisms have been specified in the PoA-DD by means of the "General operating and implementing framework of PoA" at the PoA level. The distribution mechanism is the direct distribution of ICS through the CME or regional partners.	XXXXXXXX
10	Where applicable, the conditions related to sampling requirements for the PoA in accordance with the "Standard for sampling and surveys for CDM project activities and programme of activities"	Monitoring of all CPAs will adhere to all requirements related to sampling for a PoA in accordance with the sampling standard including all annexes and amendments till EB 86 Annex 03.	XXXXXXX
11	Where applicable, the conditions that ensure that every CPA (in aggregate if it comprises of independent sub units) meets the small-scale or microscale threshold and remains within those thresholds throughout the crediting period of the CPA	The CPA shall remain under the applicable SSC limits for each component, which is 80 GWh/annum thermal energy savings (threshold as per clarification request SSC_233) for all ICS distributed under the CPA.	XXXXXXX
12	Where applicable, the requirements for the debundling check, in case the CPAs belongs to small-scale or microscale project categories.	If each of the independent subsystems/measures included in the CPA of a PoA is no larger than 1% of the small-scale thresholds defined by the methodologies applied, then the is exempted from performing de-bundling check (EB 83, Annex 13) 1% of SSC	XXXXX

		limits correspond to energy savings of 1.8 GWh	
13	Approval of CPA by CME	The CME approves each CPA to be included into its registered PoA.	XXXXX
14	CER ownership	End users receiving ICSs 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.	XXXXXX
15	Awareness and agreement of those operating a CPA on PoA subscription	Contractual provisions to ensure that those operating the CPA are aware and have agreed that their activity is being subscribed to the PoA.	XXXXXXX

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

B.6.1. Explanation of methodological choices

>>

In accordance with para 14 of AMS II.G, version 08, it is assumed that in the absence of the project activity, the baseline scenario would be the use of fossil fuels for cooking.

The actual baseline scenario is the use of charcoal, which is mainly produced using non-renewable biomass (NRB) in host country. Since NRB has higher carbon intensity than the fossil fuels proposed in AMS II.G, this assumption reduces the emission reductions significantly, making the outcome more conservative.

The quantity of biomass equivalent used in absence of the project activity for target consumers i.e urban household will be determined at the CPA level. Assessments, information used in initial CPAs may be used in subsequent CPAs in lieu of conducting fresh assessments at each CPA level.

Emission reduction calculation

According to paragraph 15 of methodology AMS II.G, version 08, emission reductions would be calculated as

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

Where:

i = Indices for the situation where more than one type of project device is introduced to replace the pre-project devices

j = Indices for the situation where there is more than one batch of project device

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

$ER_{y,i,j,}$ = Emission reductions by project device of type *i and* batch *j* during year *y* in t

CO_2e

LE_y = Leakage emissions in the year *y*

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

Where,

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

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

$f_{NRB,y}$ = Fraction of woody biomass that can be established as non- renewable biomass using survey methods or government data or default country specific fraction of non-renewable woody biomass (fNRB) values available on the CDM website

μ_y = Adjustment to account for any continued use of pre-project devices during the year *y* when applying equations 6 and 8 (fraction). Use 1.0 in other cases

$NCV_{biomass}$= Net calorific value of the non-renewable woody biomass that is substituted (IPCC default for wood fuel, 0.015 TJ/tonne, based on the gross weight of the wood that is 'air-dried')

$EF_{projected\_fossil\ fuel}$ = Emission factor for the fossil fuels projected to be used for substitution of non-renewable woody biomass by similar consumers. Use a value of 81.6 t CO_2/TJ

$N_{y,i,j}$ is monitored directly, for ***$NCV_{biomass}$*** and ***$EF_{projected\_fossilfuel}$***, the indicated default values are used, and ***LE_y*** is set to zero, since leakage is considered by multiplying ***$B_{y,savings,i,j}$*** with net to gross adjustment factor of 0.95. ***μ_y*** is set to 365, following the final response of the SSC-WG on request 713, stating that It may be set to 1 (365/365) if the number of days for which the project stove's operation does not face any constraint. (Moreover, since ER are based on the woody biomass equivalent used in the project devices, which is monitored accurately anyways).

$B_{y,savings,i,j}$ and ***$f_{NRB,y}$*** are determined as follows:

Determination of *$B_{y,savings,i,j}$*

In line with para 16 of applied approved methodology AMS II.G version08, four option given to determine $B_{y,saving,i,j}$. Here CME has chosen option third i.e. Water Boiling Test (WBT) with corresponding formula given below:

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

Where,

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

$\eta_{new,i,j}$ = Efficiency of the old devices being replaced by project devices of type *i* and batch *j*

$\eta_{old,i,j}$ = Efficiency of the project decive *i* and batch *j*

The calculations in the equations above assume that there is only one device per household. The above equation will be used for CPAs where only one stove per household is distributed. However, as initially CME is targetting to distribute the single pot ICS and to minimise time of cooking will also consider the distribution of 2 stoves per household.

Inline with para 22 of applied approved methodology AMS II.G version-08, in case 2 ICS is provided to household in project case, an adjusted formula shall be used.
For example, if 2 project devices are installed per household, 0.5 times the baseline woody biomass consumption per household ($B_{old,HH}$) is used as the total annual quantity of woody biomass that would have been used in the absence of the project activity in each device ($B_{old,i,j}$).

The baseline saving shall be determined as

$B_{old,i,j} = B_{old,c,HH}$ x6/$N_{d,HH}$

$B_{old,c,HH} = B_{old,c,p} \times N_{p,HH}$

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 (tonnes/household/year)
$N_{d,HH}$ = Number of project devices per household (number)

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

Emission due to production of charcoal is not considered in baseline as well as project scenario for simplification, which is conservative given project will reduce consumption of charcoal in project case and project emission for corresponding charcoal quantity would be lower than corresponding baseline emission for higher quantity.

Determination of the Share of Non-Renewable Biomass
According to AMS II.G, para 30, equation 11, shall be used to calculate f_{NRB}:

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

Where:
$f_{NRB,y}$: fraction of non-renewable biomass (%)
NRB: non renewable biomass (tons)
DRB: Demonstrably renewable biomass (tons)

f_{NRB} will be calculated for each CPA.

Leakage
According to AMS-II.G the following potential sources of leakage have to be considered:

A) Use of NRB savings by non-project households
According to AMS-II.G para 32 the default net to gross adjustment factor of 0.95 is applied to account for leakage and therefore surveys are not required.

B) Transfer of Equipment
"If equipment currently being utilised is transferred from outside the boundary to the project activity, leakage is to be considered."

This leakage source can be ruled out since no used improved cookstoves will be transferred or deployed from outside the geographical project boundary to the project activity.

B.6.2. Data and parameters fixed ex-ante

>>

Data / Parameter:	**$B_{old,i,j}$**
Data unit:	tonne/year
Description:	Annual quantity of woody biomass that would have been used in the absence of the project activity to generate useful thermal energy equivalent to that provided by the project device type *i* and batch *j*
Source of data:	Historical data or survey of local usage will be conducted for each target consumer group included in a given CPA
Value(s) applied:	XXX
Choice of data or Measurement methods and procedures:	Established in CPA-DD. Combination of literature and/or field survey by a dedicated expert team.
Purpose of data	Calculation of Baseline Emissions
Additional comment:	Assessments, information and results established in initial CPAs may be used in subsequent CPAs in lieu of conducting fresh assessments at each CPA level in absence of new data. Further as CME plans distribution of only one ICS per households hence $B_{old,i,j}$ equals $B_{old,HH}$

Data / Parameter:	**$B_{old,c,p}$**
Data unit:	tonnes/person/year
Description:	Annual quantity of charcoal that would have been used per person in the household in the absence of the project activity to generate useful thermal energy equivalent to that provided by the project devices
Source of data:	Historical data or survey of local usage will be conducted for each target consumer group included in a given CPA
Value(s) applied:	XXX
Choice of data or Measurement methods and procedures:	Established in CPA-DD. Combination of literature and/or field survey by a dedicated expert team.
Purpose of data	Baseline emission calculation
Additional comment:	The value will be fixed ex-ante

Data / Parameter:	**$N_{P,HH}$**
Data unit:	Number
Description:	Average number of persons served per household prior to project implementation
Source of data:	Established ex-ante based on literature and/or field survey by a dedicated expert team.
Value(s) applied:	6.05

Choice of data or Measurement methods and procedures:	The value is chosen based on survey report
Purpose of data	Baseline emission calculation
Additional comment:	The value is fixed ex-ante

Data / Parameter:	η_{old}
Data unit:	%
Description:	Efficiency of the system being replaced (Traditional charcoal Cooking Stoves)
Source of data:	Third party test report
Value(s) applied:	20
Choice of data or Measurement methods and procedures:	The efficiency of baseline charcoal based stove is determined by third party using KPT.
Purpose of data	Calculation of Quantity of charcoal that is saved in tonnes per device
Additional comment:	The value is fixed ex-ante

Data / Parameter:	$NCV_{biomass}$
Data unit:	TJ/tonne
Description:	Net calorific value of the non-renewable woody biomass that is substituted
Source of data:	Default value as per applied methodology AMS II.G version 08
Value(s) applied:	0.015
Choice of data or Measurement methods and procedures:	Default value as per applied methodology AMS II.G version 08
Purpose of data	For calculation of emission reduction
Additional comment:	The value is fixed ex-ante

Data / Parameter:	$EF_{projected\_fossilfuel}$
Data unit:	tCO_2/TJ
Description:	Emission factor for the substitution of non-renewable woody biomass by similar consumers
Source of data:	Default value as per applied methodology AMS II.G version 08
Value(s) applied:	81.6
Choice of data or Measurement methods and procedures:	This value represents the emission factor of the substitution fuels likely to be used by similar users, on a weighted average basis. It is assumed that the mix of present and future fuels used would consist of a solid fossil fuel (lowest in the ladder of fuel choices), a liquid fossil fuel (represents a progression over solid fuel in the ladder of fuel use choices) and a gaseous fuel (represents a progression over liquid fuel in the ladder of fuel use choices). Thus a 50% weight is assigned to coal as the alternative solid fossil fuel (96 tCO2/TJ) and a 25% weight is assigned to both liquid and gaseous fuels (71.5 tCO2/TJ for Kerosene and 63.0 tCO2/TJ for Liquefied Petroleum Gas (LPG).
Purpose of data	For calculation of emission reduction
Additional comment:	The value is fixed ex-ante

Data / Parameter:	L_Y
Data unit:	Fraction
Description:	Leakage adjustment factor
Source of data:	Default value as per applied methodology AMS II.G version 08
Value(s) applied:	0.95
Choice of data or Measurement methods and procedures:	As per the methodology AMS II.G/v06, *Bold* can be multiplied by a net to gross adjustment factor of 0.95 to account for leakages, in which case surveys are not required.
Purpose of data	For calculation of emission reduction
Additional comment:	The value is fixed ex-ante

Data / Parameter:	μ_Y
Data unit:	--
Description:	Number of days of utilization of the ICS during the year '*y*'.
Source of data:	As per applied methodology AMS II.G version 08 and final response of the SSC WG on request 713.
Value(s) applied:	365
Choice of data or Measurement methods and procedures:	μ_y is set to 365, following the final response of the SSC-WG on request 713, stating that it may be set to 1 (365/365) if the number of days for which project stoves operation does not face any constraint. In the case where the efficient project stove was operated only for a part of the year due to logistics of the stove distribution during the initial phase of the project implementation, as also mentioned in final response of the SSC- WG on request 713, the provisions for monitoring of parameter $\boldsymbol{N_{y,i,j}}$ in section B.7.1 guarantee that only the real operation time is considered.
Purpose of data	For calculation of baseline emission
Additional comment:	The value is fixed ex-ante

Data / Parameter:	$f_{NRB,y}$
Data unit:	Fraction
Description:	Fraction of woody biomass saved by the project activity during year *y* that can be established as non-renewable biomass
Source of data:	Sub national survey report conducted by third party expert
Value(s) applied:	XXX
Choice of data or Measurement methods and procedures:	The value will taken from survey report conducted for specific CPA(s) and will be fixed ex-ante.
Purpose of data	For calculation of baseline emission
Additional comment:	The value is fixed ex-ante

Data / Parameter:	**Life span**
Data unit:	Number of years
Description:	The operating lifetime of the project device.
Source of data:	Lab test report
Value(s) applied:	XXX

Choice of data or Measurement methods and procedures:	The value will taken from third party test report conducted for specific ICS type and will be fixed ex-ante. The loss in efficiency should be applied as default value 2% per year as per para 25 a) of AMS II.G version-08.
Purpose of data	For calculation of baseline emission
Additional comment:	The value is fixed ex-ante

B.6.3. Ex-ante calculations of emission reductions

>>

Emission reductions for each SSC-CPA will be calculated according to the following formula: The sample calculation below is shown for single pot ICS, considering number of ICS per household.

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

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 (assumed 94%)

$NCV_{biomass}$= Net calorific value of the non-renewable woody biomass that is substituted (IPCC default for wood fuel, 0.015 TJ/tonne, based on the gross weight of the wood that is 'air-dried')

$EF_{projected\_fossil\ fuel}$ = Emission factor for the fossil fuels projected to be used for substitution of non-renewable woody biomass by similar consumers. Use a value of 81.6 t CO_2/TJ

Further,

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

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*

$\eta_{new,i,j}$ = Efficiency of the old devices being replaced by project devices of type *i* (45%)

$\eta_{old,i,j}$ = Efficiency of the project decive *i (19%)*

Where

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

$B_{old,c,HH}$ = 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 (tonnes/household/year)

$B_{old,c,HH} = 0.956$ tonnes charcoal/household/year (as per survey report)

$B_{old,i,j} = 0.956 \times 6$

$B_{old,i,j} = 5.736$ tonne wood equivalent/household/year

1. For example considering one IC stove per household, the number of IC stoves will be 13063 the saving is calcualted as

$B_{y,saving,i,j}$ = 5.736 x [1- (19%/45%)

$B_{y,saving,i,j}$ = 3.314 tonne wood/per year/per stove
Adjusting leakage factor
$B_{y,saving,i,j}$ = 3.314 x0.95 tonne wood/per year/per stove
$B_{y,saving,i,j}$ =3.148 tonne wood/per year/per stove

Hence
ER_y = 3.148 x 13063 x 0.94 x 0.015 x 81.6

ER_y = 47310 tCO_2e/year

2. For example considering 2 IC stove per household, the number of IC stoves will be 28553 the saving is calcualted as
$B_{y,saving,i,j}$ =5.735x0.5 (in line with para 22 of AMS II.G version-08)
$B_{y,saving,i,j}$ =2.868 tonne wood/per year/per stove

Hence
ER_y = 2.868 x 28553 x 0.94 x 0.015 x 81.6

ER_y = 47328 tCO_2e/year

B.7. Application of the monitoring methodology and description of the monitoring plan

B.7.1. Data and parameters to be monitored by each generic CPA

Data / Parameter:	**$N_{y,i,j}$**
Data unit:	Number
Description:	Number of project devices of type *i* and batch *j* operating during year *y*
Source of data:	Stove sales database and Survey records
Value(s) applied	XXX
Measurement methods and procedures:	The total number of appliances by type and age deployed during period y is tracked in the Project Database of the specific CPA, which is updated regularly. All appliances distributed will be recorded for installation date and recipient / location. The sales date for each appliance listed in the Project Database of each CPA signifies the start of operation for each appliance type. *Sampling Frame:* Project Database of each CPA (or combined PoA database in case of PoA level sampling) as defined by sales date, appliance type, serial number, and end-user information. *Sample Size and Desired Precision:* see PoA-DD, Part II, Section B.7.2. *Sample Method:* see PoA-DD, Part II, Section B.7.2. 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 project implementer (if different than CME) shall maintain a sales record to calculate this parameter. The CME supervises the activities of each CPA implementor (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. Also, if at the CPA-level it is assumed ex-ante that there is only one project stove being used per household for calculating $B_{old,i}$, then, ex-post sampling based monitoring shall also include assessment of presence of multiple operational project stoves in a sampled household. The number of project stoves in the CPA shall be adjusted accordingly to claim emissions reduction only for one operational project stove per household to ensure equivalence with the baseline established.

Data / Parameter:	$\eta_{new,c,i,j}$
Data unit:	%
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 report conducted by an independent third party during the annual ICS users' survey
Value(s) applied	XXX
Measurement methods and procedures:	For each types of ICS disseminated under the programme. Separate Water Boiling Test will be carried out for these ICS using standard testing protocol. The efficiency test will be carried out for different types and models of ICS. The value obtained from the test will be used to calculate the emission reductions of the systems for that year of operation. Sample for this survey will be drawn as per the "Guidelines for sampling and surveys for CDM project activities and programme of activities
Monitoring frequency:	(i) Recorded at the time of commissioning/distribution (ii) Adjusted for the loss if efficiency as paragraph 25.
QA/QC procedures:	The test will be carried out once every year by an independent third party. As required by AMS II.G for annual surveys, the margin of error 10% and a confidence interval of 90% will be ensured for the monitoring the efficiency of stoves.
Purpose of data	The monitored value of this parameter will be used in the determination of the ex-post emission reduction for all CPAs.
Additional comment:	If any sample stove is found to be operating below the 20% efficiency, the proportionate number of stoves of that type included in the CPA will be considered to be non-operational and not accounted for ER calculation.

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 record of ICS
Value(s) applied	XXX
Measurement methods and procedures:	For each batch the date of distribution of first ICS will be recorded and used as date of commissioning for that batch.

Monitoring frequency:	Recorded at the time of commissioning/distribution of first ICS of the batch
QA/QC procedures:	NA
Purpose of data	Star date
Additional comment:	The record to be kept for crediting period + 2 years

Data / Parameter:	$N_{d,HH}$
Data unit:	Number
Description:	Number of project devices distributed per household
Source of data:	Sales record of ICS
Value(s) applied	XXX
Measurement methods and procedures:	Recorded at the time of commissioning/distribution of project devices and it can be crosschecked with user details having number of ICS.
Monitoring frequency:	Recorded at the time of commissioning/distribution of ICS
QA/QC procedures:	The proecure will be developed in electronic system to record number of ICS provided to particular household in any CPA
Purpose of data	To calculate baseline emission
Additional comment:	The record to be kept for crediting period + 2 years

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

Please refer generic CPA-1 above for sampling and monitoring plan.

Appendix 1. Contact information of coordinating/managing entity and responsible person(s)/ entity(ies)

CME and/or responsible person/ entity	☒ CME ☒ Responsible person/ entity for application of the selected methodology(ies) and, where applicable, the selected standardized baseline(s) to the PoA
Organization	Tandavanala
Street/P.O. Box	1099
Building	Besorohitra
City	Fianarantsoa
State/Region	--
Postcode	301 Fianarantsoa
Country	Madagascar
Telephone	+261 20 75 516 58
Fax	--
E-mail	manantsoa@tandavanala.org
Website	www.tandavanala.org
Contact person	Tiana Manantsoa
Title	Executive Director
Salutation	Mr
Last name	Manantsoa
Middle name	Tiana

PP and/or responsible person/ entity	☒ Project Participant ☐ Responsible person/ entity for application of the selected methodology(ies) and, where applicable, the selected standardized baseline(s) to the PoA
Organization	Norwegian Ministry of Climate and Environment
Street/P.O. Box	Kongens gate
Building	20
City	Oslo
State/Region	--
Postcode	0153
Country	Norway
Telephone	+47 2224 6057
Fax	--
E-mail	Edit-Anita.Norgaard@kld.dep.no
Website	--
Contact person	Edit Anita Nordgaard
Title	---
Salutation	Ms
Last name	Nordgaard
Middle name	Anita

Appendix 2. Affirmation regarding public funding

The proposed PoA does not envisage to utilise public funding or ODA.

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

Please refer section of PoA DD

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

Please refer section of generic CPA

Appendix 5. Further background information on the monitoring plan

Please refer relevant section of generic CPA

Appendix 6. Summary of post registration changes

Not applicable

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Document information

Version	*Date*	*Description*
05.0	15 April 2016	Revision to ensure consistency with the "Standard: Applicability of sectoral scopes" (CDM-EB88-A04-STAN) (version 01.0).
04.0	9 March 2015	Revisions to: • Include provisions related to choice of start date of PoA; • Include provisions related to delayed submission of a monitoring plan; • Provisions related to local stakeholder consultation; • Add exception for generic CPA where technology is under positive lists; • Editorial improvement.

Version	*Date*	*Description*
03.0	25 June 2014	Revisions to: • Include the Attachment: Instructions for filling out the programme design document form for small-scale CDM programme of activities (these instructions supersede the "Guideline: Completing the programme design document form for small-scale CDM programme of activities" (Version 03.0)); • Include provisions related to standardized baselines; • Add contact information on a responsible person(s)/ entity(ies) for the application of the methodology (ies) to the PoA in B.4 and Appendix 1; • Add general instructions on post-registration changes in paragraphs 2 and 3 of general instructions and **Error! Reference source not found.**; • Change the reference number from *F-CDM-SSC-PoA-DD* to *CDM-SSC-PoA-DD-FORM*; • Editorial improvement.
02.0	13 March 2012	EB 66, Annex 13 Revision required to ensure consistency with the "Guidelines for completing the programme design document form for small-scale CDM programmes of activities".
01.0	27 July 2007	EB33, Annex43 Initial adoption.

Decision Class: Regulatory
Document Type: Form
Business Function: Registration
Keywords: programme of activities, project design document, SSC project activities