 <p align="center">Component project activity design document form for small-scale CDM component project activities (Version 05.0)</p>	
<p><i>Complete this form in accordance with the Attachment "Instructions for filling out the component project activity design document form for CDM small-scale component project activities" at the end of this form.</i></p>	
<p align="center">COMPONENT PROJECT DESIGN DOCUMENT (CPA-DD)</p>	
Title of the CPA	Improved Jikos Project —CPA03
Version number of the CPA-DD	05
Completion date of the CPA-DD	07/09/2016
Title of the PoA to which the CPA is included	Clean Cook-Stoves in Sub-Saharan Africa by ClimateCare Limited
Host Party	Kenya
Estimated amount of annual average GHG emission reductions	40,064
Applied methodology(ies) and, where applicable, applied standardized baseline(s)	AMS-II.G. ver. 04 - Energy efficiency measures in thermal applications of non-renewable biomass
Sectoral scope(s) linked to the applied methodology(ies)	3: Energy demand

SECTION A. General description of CPA**A.1. Title of the proposed or registered PoA**

>>

Clean Cook-Stoves in Sub-Saharan Africa by ClimateCare Limited

A.2. Title of the CPA

>>

Title: Improved Jikos Project -CPA03

Version: 05

Date: 07/09//2016

A.3. Description of the CPA

>>

This Small Scale Component Project Activity (CPA) entitled “Improved Jikos Project –CPA03” is a component of the Programme of Activities (PoA); “Clean Cook Stoves in Sub-Saharan Africa by ClimateCare Limited”. The purpose of this CPA is to promote and distribute use of Improved Efficient Charcoal Stoves (ECS) which provide the same service with significantly less fuel than the charcoal stoves in common use in Kenya, the project host. The CPA aims to establish regular use of Efficient Charcoal Stoves (ECS) by distributing about 82,368 ECS in total within Kenya. The adoption and usage of the improved cook-stoves therefore constitutes the project scenario.

The ECS to be distributed will have to meet minimum specifications of Thermal efficiency of greater than 20% and use charcoal as the primary fuel.

Under this CPA03, ClimateCare is acting as Coordinating Managing Entity (CME) and also as Project Implementer, will work with different Programme Activity Implementer (PAI), starting with Finlays Horticulture Fairtrade Association (FHFA), acting as the first PAI to distribute an appropriate Efficient Charcoal Stoves (ECS) design in collaboration with ClimateCare (CME). This CPA has contracted FHFA who will distribute Jiko Koa stoves, which is manufactured by a third party entity i.e. Burn manufacturers who have been contracted by ClimateCare and FHFA for the supply of the stoves. The PAI will also create awareness of, market, distribute and sell on a commercial basis starting with two project sites in Kenya, i.e. Naivasha and Timau, with further expansion to other sites. The PAI will also collect and archive stoves sales data and maintain the Sales Database. Other stoves which meets the thermal efficiency specification maybe identified and be included for distribution, however, each PAI can only distribute one stove model/design.

CME in collaboration with each PAIs and the stove manufacturers will set up, apply procedures, appropriate records and documentation control process to assert legal rights of the carbon credits generated and to avoid double counting. Using either Warranty Card system, Mobile phone activation system or any other appropriate system, each PAI will transfer the information of each ECS sold to the Sales Database, which will ensure that no ECS is counted more than once under the CPA as per the PoA-ADD. The Sales Database will also serve as the basis for the calculation of CERs since it will contain all information regarding the user. The database will contain the dates the stoves are sold to end users and this will help in determining the 1 day lag time accounted for each stove in calculation of emission reductions.

Accordingly, each PAI will use the CER proceeds to reduce costs of ECS to users, provide maintenance and recoup associated costs for the dissemination of stoves.

Measures for continual improvements of the PoA management have been established and will be implemented with each CPA.

According to an ex-ante calculation, the proposed CPA will contribute, on average, 40,064 tonnes of CO₂ of emissions reduction per annum equivalent and the CPA will not exceed a total of 180 GWh_{th}/year of thermal energy savings.

There are no laws, policies or mandatory requirements in Kenya, stipulating the adoption of efficient charcoal cook-stoves and this CPA is a voluntary action by the first PAI. The project activity's sustainable development contributions have been identified in the SSC-PoA-DD.

Contribution of the proposed SSC-PoA to sustainable development

- *Air quality*: Children and mothers will be exposed to fewer air pollutants through reduced emission of not only CO₂, but also carbon monoxide and particulate matter. Air pollution from cooking with solid fuel is a key risk factor for childhood pneumonia as well as many other respiratory diseases and cancer¹.
- *Biodiversity*: will be improved as the project reduces pressure on remaining forest due to reduced charcoal demand in the households.
- *Livelihood of the poor*: the circumstances of families will be improved since the stoves reduce cost of expenditure for domestic fuel. Reduction in charcoal consumption implies relief from drudgery and more opportunity for productive activity.
- *Access to energy services*: The ECSs require less fuel, which in many areas, is a scarce resource or very expensive to buy. Users have also found ECSs more convenient, shortening the cooking time.

A.4. Entity/individual responsible for the operation of CPA

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The CPA is implemented by CME in collaboration with several PAIs starting with FHFA, which will act both as the principal distributor of the stoves. The stoves will be sourced from a leading manufacturer in Nairobi or any other local manufacturer.

A.5. Technical description of the CPA

>>

The CPA will install ECS which meets the minimum specification of:

- a) Thermal Efficiency of more than 20%,
- b) Stoves fuel type used must be charcoal,
- c) The stoves be manufactured locally and will be distributed to targeted beneficiaries.

The CME will identify PAI whom he will work with in order to distribute the stoves.

The first PAI identified by the CME and project implementer is FHFA who will distribute the Jikokoa stove. The Jikokoa is a household charcoal stove that has been designed and manufactured in an industrial facility in Ruiru factory, Nairobi. The stove consumes less fuel in provision of household energy, at the same time increasing the output power.

Jiko Koa Stove

The stoves has combustion chamber made of stainless steel metal sheet to prevent corrosion and rusting and increases the thermal efficiency.

The stove has been independently tested by the Kenya Industrial Research Institute. The results of the test shows that the stove has 44.9% fuel efficiency.

¹ World Health Organization, 2005 - <http://www.who.int/mediacentre/factsheets/fs292/en/index.html>

**Key Parameters**

Power Output: 2.95 kW

Thermal Efficiency: 44.9%

This CPA has projected operating stoves averaging 82,368 ECSs per year over 7 years. Through the ex-ante calculations, the annual energy saving per Jiko Koa stove is estimated at 0.0022 GWh_{th}. On average, the CPA will contribute to a total fuel saving equals to 180 GWh_{th} annually and must not exceed that.

The baseline scenario is the same as the existing scenario where the same amount of household energy needs is met through the baseline stoves, used in most urban areas of Kenya.

Going forward, other types of stoves could be included in the project. The stoves to be must meet the following minimum specification:

- a) Thermal Efficiency of more than 20%,
- b) Stoves fuel type used must be charcoal,
- c) The stoves be manufactured locally and will be distributed to targeted beneficiaries

A.6. Party(ies)

Name of Party involved (host) indicates host Party	Private and/or public entity(ies) CPA implementer(s) (as applicable)	Indicate if the Party involved wishes to be considered as CPA implementer (Yes/No)
Kenya (host)	ClimateCare Limited (CME) and Project Developer (private)	No

A.7. Geographic reference or other means of identification

>>

All the stoves to be distributed by the CPA will have serial numbers which is sequential and unique. The serial number should be easily differentiated from other stove types in the market and will be attached to the stove with a sticker or be engraved.

For example, the Jikokoa stove which is being distributed has 10 digit serial number which is randomised. The stoves have barcodes which are scanned twice in the factory; at production (lot traceability) and a second time at shipping (customer information). There is also SMS-based warranty registration system that is opt-in for the current customers. That system, combined with factory Manufacturing Requirement Planning (MRP) system allows the following data to be collected through text messages:

- 1) Customer Name
- 2) Customer Phone Number
- 3) Serial Number
- 4) Registration Date
- 5) Sales Organization
- 6) County/Location

ECS in the CPA is uniquely identified by the information collected and stored in the Sales Database, including the serial number, which uniquely identifies each ECS.

The CPA will start distributing ECS in two locations in Kenya, where FHFA has operational presence i.e. Naivasha (0°50'13.99"S, 36°21'3.36"E) and Timau (0° 3'0.60"N, 37°11'45.13"E). These two locations are exclusive to the specific CPA, however, other sites will be included later as more PAI are recruited into the stove distribution in the CPA, provided that the unique CPA identification and traceability is maintained to avoid double counting.

A.8. Duration of the CPA**A.8.1. Start date of the CPA**

>>

26/02/2014 (Financial close)

A.8.2. Expected operational lifetime of the CPA

>>

21 years 0 Months

A.9. Choice of the crediting period and related information

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Renewable crediting period

A.9.1. Start date of the crediting period

>>

01/04/2016 or date of inclusion which comes last

A.9.2. Length of the crediting period

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7 years and 0 months with 2 renewal periods

A.10. Estimated amount of GHG emission reductions

Emission reductions during the crediting period

Years	Annual GHG emission reductions (in tonnes of CO ₂ e) for each year
2016	10,307
2017	27,244
2018	40,243
2019	54,055
2020	63,064
2021	67,569
2022	17,969
Total number of crediting years	7
Annual average GHG emission reductions over the crediting period	40,064
Total estimated reductions (tonnes of CO ₂ e)	280,450

A.11. Public funding of the CPA

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The CPA has received some funding from DFID to subsidise the stove purchase price and set up loan revolving fund. However, CERs from the CPA will not be used or be claimed by annex 1 country. See affirmation in Annex 2 below.

A.12. Debundling of small-scale component project activities

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According to the “Guidelines on assessment of debundling for SSC project activities, v03 (EB 54, Annex 13, par. 10) for determining the occurrence of debundling under a Programme of Activities (PoA)”, if each of the independent subsystem/measures included in the CPA of a PoA is not larger than 1% of the small scale threshold defined by the methodology applied, then that CPA of the PoA is exempted from performing de-bundling check, i.e. considered as being not a de-bundled component of a large scale activity

Furthermore, the CPA is limited by the small scale threshold of AMS II.G (ver. 04.0), i.e. the maximum energy savings of the sum of all ECSs implemented under a specific CPA shall not exceed thermal energy savings of 180 GWh/year (threshold as per clarification request SSC_233; <http://cdm.unfccc.int/methodologies/DB/6U8JYO9XTLVZ8LJ7GUBSZP145BIDG2>).

Through the ex-ante calculations, the annual energy saving per stove is estimated at 0.0022 GWh_{th}. This is less than less than 1.8 GWh_{th} (1% of the 180 GWh_{th} threshold for small scale projects). This CPA is therefore considered as being not a de-bundled component of a large scale activity. Other stoves which shall be included in the CPA (in addition to the Jiko Koa) will be checked to ensure that the annual energy saving per stove is less than 1% of the SSC threshold.

A.13. Confirmation for CPA

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This small-scale CPA is neither registered as an individual CDM project activity nor part of another registered PoA (See the signed PoA Joining Agreement between CME and PAI). All ECS under the CPA are uniquely identified by their serial numbers recorded in the Sales Database which ensures no double counting. Therefore no ECS distributed under this CPA will not be part of another single CDM project activity or CPA under another PoA.

At the time of joining the PoA, it has been checked and verified by the CME, through the UNFCCC, Gold Standard and Voluntary Carbon Standard websites on 07/03/2016 that the CPA is neither registered nor intends to register with any of the carbon schemes. Confirmation from the CPA

Implementer to the CME that the CPA has/shall not been proposed as an individual CDM project and/or as a part of any other CDM PoA and/or any other mechanism to avail climate change mitigation benefits has been provided through the PoA Joining Agreement.

A.14. Contact information of responsible persons/ entities for completing the CDM-SSC-CPA-DD-FORM

>>

ClimateCare Limited
P/O/ Box 856-00606,
Nairobi – Kenya

SECTION B. Environmental analysis

B.1. Analysis of the environmental impacts

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As per the SSC-PoA, the Environmental Analysis is to be carried out at the PoA level, unless required by the host country. This CPA is not subject to Environmental Impact Assessment in the country.

SECTION C. Local stakeholder consultation

C.1. Solicitation of comments from local stakeholders

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A stakeholder consultation was conducted at the CPA level. Starting with the FHFA who are the first PAI in the CPA.

The local stakeholder comments were conducted in line with the requirement of the CDM. The consultation meetings took place from 11th to 13th November 2014 at Flamingo and Kingfisher Flower farms in Naivasha and on 22nd and 23rd January 2015 in Ibis and Siraj Farms in Timau. Since the project beneficiaries are majorly Finlays workers, the invitation was done using a poster/banner which was displayed at the public notice board and communication through their appointed representatives to the Fairtrade Association. The consultation was convened to discuss the benefits of the cook stoves program and learning and sharing the experiences of the people who had a stove as part of the testing stage.

Invitation was done through notice board and selective participation of key representatives of the association members and officials from government offices. The meeting was conducted in national language (Kiswahili) which everybody was able to speak and understand. The project was design and operation was explained to the project participants followed by a group discussion of the social, environmental, and economic impacts of the project activity.

The meeting followed the general approach:

1. Explanation of the project
2. Project stove experience usages demonstrations
3. Experience sharing, questions, answers and clarification
4. Closure of the meeting

C.2. Summary of comments received

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At the stakeholder consultation, participants were informed about the project and given an opportunity to discuss the impact the project they think it would have on individuals, the target community, and local environment. Stakeholder comments and feedback was largely positive and in support of the project.

The stakeholders gave an affirmative response that the project will benefit them a lot and reduce the burden on household energy provision. They said that the project reduced fuel consumption and this will go a long way in ensuring that their household energy cost for cooking is reduced.

Since the project is delivering a subsidised project stove and paid in instalment, the stakeholders said that, the subsidy has helped them acquire the stove which if bought at market price, it will have been impossible to purchase at go.

Below is a summary from both meetings in point form:

- a) The following are the summary of their comments
- b) The stove has appealing looks.
- c) It is user friendly since it will not dirty the house by allowing ash to fall around.
- d) Its light weight and easy to carry around.
- e) It does not get too hot from the outside, hence the incidences of getting burnt are reduced.
- f) It saves charcoal and can burn very hot by having few charcoal in the combustion chamber.
- g) If it can last long time then, there is value for one to invest in it.
- h) Since it has been subsidised, then it is affordable.
- i) If the stove reduces smoke and said, then it will be nice to use it since the clothes will stop smelling smoke and one can easily cook in the house using it.

C.3. Report on consideration of comments received

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No adverse comments were received. Only minor questions on smoke reduction and fuel savings achieved were raised which were satisfactorily answered.

SECTION D. Eligibility of CPA and estimation of emissions reductions

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

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The small scale approved baseline and monitoring methodology AMS-II.G, vers 04.0; "Energy efficiency measures in thermal applications of non-renewable biomass"; Version 04 (EB 60, Annex 21). Refer <http://cdm.unfccc.int/methodologies/DB/6U8JYO9XTLVZ8LJ7GUBSZP145BIDG2>.

As per the PoA-DD, the value of fraction of non-renewable (f_{NRB}) applied in a component project activity (CPA) of a POA will be determined either by use of default national values approved by the Board (where available) or by calculation using the "Information note; Default values of fraction of non-renewable biomass for least developed countries and small island developing states, version 01.0 (EB 67, Annex 22)².

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

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² The approach is applicable to all LDC and countries and parties which had fewer than 10 registered clean development mechanism project activities as of 31 December 2010. This will be the case for all the countries covered by the PoA.

Applicability Requirement of AMS.IIG, Version 04	CPAs under the PoA	Criteria Met?
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	The CPA involves the distribution of energy efficient charcoal cook stoves	Yes
Single pot or multi pot portable or in-situ cook stoves with specified efficiency of at least 20%.	<p>The Water Boiling Tests conducted on the stove by Kenya Industrial Research Institute (KIRDI) show that the stoves have an average thermal efficiency of 44.9%.</p> <p>Future stoves types being added to the CPA will be tested to ensure that their efficiency is at least 20%.</p>	Yes
The efficiency of the project systems shall be certified by a national standards body or an appropriate certifying agent recognized by it. Alternative manufacturer's specification may be used;	The Jiko Koa has been independently tested by Kenya Industrial Research and Development Institute (KIRDI).	Yes
<p>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, if required on a sample basis using a 90/30 precision for the selection of samples, and accounted for:</p> <p>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 Bold is adjusted to account for the quantified leakage;</p> <p>b) Increase in the use of non-renewable woody biomass outside the project boundary to create non-renewable woody biomass baselines can also be a potential source of leakage. If this leakage assessment quantifies an increase in the use of non-renewable woody biomass outside the project boundary then Bold is adjusted to account for the quantified leakage;</p> <p>c) As an alternative to subparagraphs (a) and (b), old B can be multiplied by a net to gross adjustment factor of 0.95 to account for leakages, in which case surveys are not required.</p>	Alternative (c) to subparagraphs (a) and (b) has been applied and B_{old} has been multiplied by a net to gross adjustment factor of 0.95 to account for leakages, in which case surveys are not required.	Yes
Project participants are able to show that non-renewable biomass has been used since 31 December 1989, using survey methods or referring	Between 1990 and 2010, Kenya lost an average of 12,050 ha or 0.32% per year. In total, between 1990 and 2010,	Yes

to published literature, official reports or statistics.	Kenya lost 6.5% of its forest cover, or around 241,000 ha In 2005, all the wood used was used came from forests and was used either as industrial roundwood or woodfuel. In 2005, 1.6 million m ³ was harvested for industrial roundwood and 27.4 million m ³ was used as fuelwood. In summary 94 per cent of wood removal in 2005 was to be used as fuelwood and all of it came from forests. In total the country lost 6.5 per cent of forest cover in that 20-year period. Since forest cover has been decreasing steadily since 1990 it can be concluded that non-renewable biomass has been used in Kenya since 31 December 1989 ³ .	
The project participants shall apply the general guidelines to SSC CDM methodologies as per paragraph 21 of the "General guidelines for SSC methodologies"; Version 18.0.	On average each Jiko Koa used saves 0.0022 GWh _{th} which is less than 1.8 GWh _{th} , and is considerably less than, 1% of the energy limit for Type II projects using small-scale methodologies (threshold of 180 GWh thermal savings ⁴). Also the total number of stoves under the CPA has been capped at 82,368. This ensures that the total energy saving of the CPA does exceed the threshold limit and is therefore small-scale (See also the emission Reductions calculation spreadsheet). If other stove designs are added to the CPA03, the cap of the total number of stoves will be recalculated (and the annual number of stoves required to reach the small scale threshold will be monitored, as described in the monitoring plan).	Yes

Reference should also be made to Section D.5 below (Demonstration of eligibility for a CPA).

B_{old} is determined using option 7 (a) of the methodology AMS-II.G, version 04.0 (historical data). B_{old} is multiplied by a net to gross adjustment factor of 0.95 to account for NRB-related leakages, and by another net to gross adjustment factor of 0.95 to account for PoA-related leakages. Monitoring of both types of leakages will therefore not be required. To determine B_{old} , the baseline charcoal consumption is multiplied by 6⁵.

$B_{y, saving}$ is estimated from adjusted B_{old} using Option 2 of AMS-II.G, vers 04.0. To determine the number of stoves in operation, the total number of stoves sold is adjusted for a statistically

³ <http://rainforests.mongabay.com/deforestation/2000/Kenya.htm>

⁴ See clarification request SSC_233;

<http://cdm.unfccc.int/methodologies/DB/6U8JYO9XTLVZ8LJ7GUBSZP145BIDG2>

⁵ This conversion factor is based on the last paragraph of page 1.45 of the *Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories: Reference Manual*⁶, which states as follows:
"If no local information is available, 6 kg of wood input per kg of charcoal may be used as default (FAO, 1990)".

determined drop-off rate. However, for ex-ante calculations, the dropout rate has been estimated at 5%, based on experience with a similar project and exercising conservativeness.

On annual basis, the following will be determined through sampling and testing in accordance with the “Standard for sampling and surveys for CDM project activities and Programme of Activities”, Version 03.0 and the methodology AMS-II.G, Version 04.0:

- The efficiency of the project stoves (η_{new})
- The rate of drop off of the stoves in year y , DO_y .

The continued use of baseline stoves will be monitored through a statistically valid sample surveys. The samples will be determined as per the monitoring plan.

When annual inspection is chosen a 90% confidence interval and 10% margin of error shall be achieved for the sampled parameters. When biennial inspection is chosen a 95% confidence interval and a 10% margin of error requirement shall be achieved for the sampled parameters. In cases where survey results indicate that 90/10 precision or 95/10 precision is not achieved, for the first two years of the crediting period, the lower bound of a 90% or 95% confidence interval of the parameter value may be chosen as an alternative to repeating the survey efforts to achieve the 90/10 or 95/10 precision.

The monitoring plan has been discussed in detail in Section D.7.2.

D.3. Sources and GHGs

>>

Source		Gas	Included?	Justification / Explanation
Baseline	Combustion of non-renewable biomass for cooking in inefficient cook stoves. (Cooking with inefficient baseline stoves).	CO ₂	Yes	Major source of emissions
		CH ₄	No	Minor source of emissions.
		N ₂ O	No	Minor source of emissions.
Project activity	Combustion of non-renewable biomass for cooking in efficient cook stoves. (Cooking with fuel efficient project stoves).	CO ₂	Yes	Major source of emissions
		CH ₄	No	Minor source of emissions.
		N ₂ O	No	Minor source of emissions.

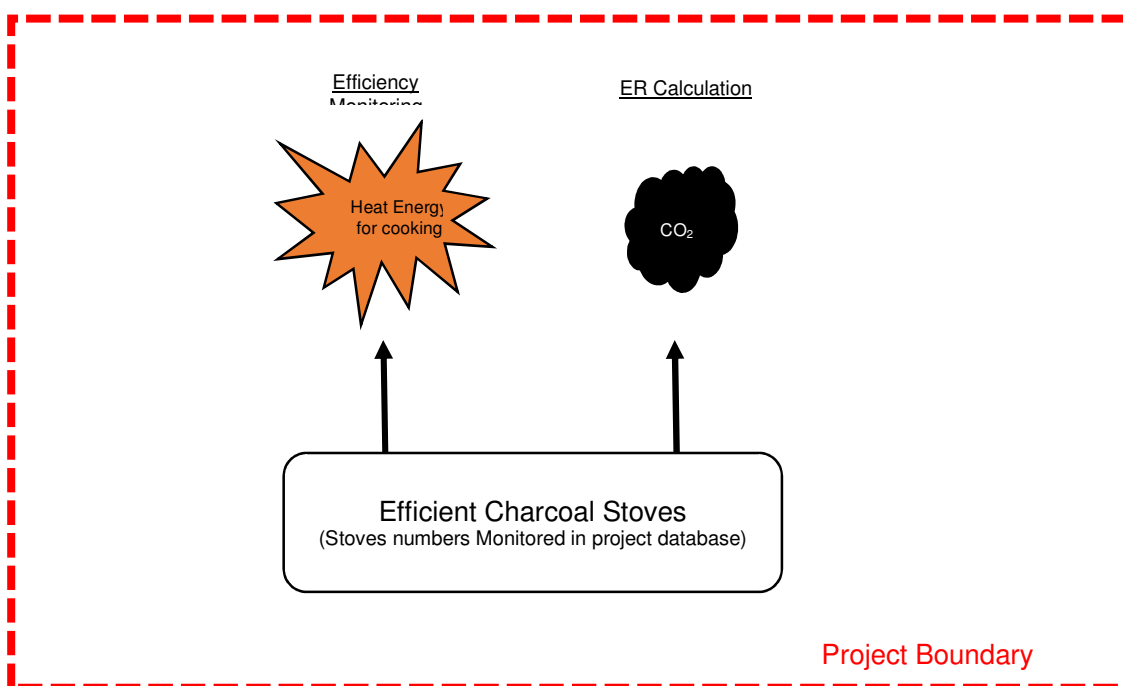


Figure 2: Project Boundary of a typical CPA.

This CPA is located within the geographical boundary of Kenya which lies within the geographic boundary of the registered PoA.

D.4. Description of the baseline scenario

>>

According to the methodology applied, AMS-II.G, Version, 04.0, it is assumed that in the absence of the project activity, the baseline scenario would be the use of fossil fuels for meeting similar thermal energy needs.

The proposed CPA03, will disseminate Jiko Koa cook stoves with a thermal efficiency of 44.9% which will replace baseline stoves mostly charcoal stoves currently used for domestic cooking. This action will lead to a reduction in the use of non-renewable biomass. As per the methodology specification, a value of 81.6 tCO₂/TJ is used as the emission factor for the substitution of non-renewable biomass by the project stoves.

The key baseline data is presented in the table below.

Parameters	Description	Value	Comments
B _{old, appliance, survey}	The average quantity of charcoal used in the absence of the project activity by each appliance in tonnes as determined from the baseline survey	3.37 tonnes/yr	Value obtained from review of historical data literature published by independent organisations. The charcoal consumption value is then multiplied with 6 to convert from charcoal to wood to arrive at 4.01.
η _{old}	Efficiency of the old stove	0.2	A default value
f _{NRB,y}	Fraction of woody biomass saved by the project activity in year y that can	0.92	Default value approved by the CDM EB for Kenya.

	be established as non-renewable biomass		
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The thermal energy baseline has been derived using historical data applicable for Kenya. Using data from a research carried out by Camco Advisory Services (Kenya) limited in 2013 for Kenya Forest Services (KFS), titled “Analysis of the charcoal value chain in Kenya”⁶, it was established that per capita charcoal consumption in rural areas is 156kg compared to 152kg in urban areas.

D.5. Demonstration of eligibility for a CPA

>>

In compliance with the “*Standard for demonstration of additionality, development of eligibility criteria and application of multiple methodologies for programme of activities*”, version 01.0 (EB 65, Annex 3), the CPA is eligible for inclusion in the PoA as demonstrated below:

Description	Conditions to be met	Means of proof	Have the conditions been met? Yes/No
The geographical boundary of the CPA including any time-induced boundary consistent with the geographical boundary set in the PoA	The CPA will be located within the geographical boundary set in the PoA in Section A.5, namely, Ghana and Kenya with the possibility of expanding to other Sub-Saharan African countries.	Location and boundary of the CPA is specified in the specific CPA. The database maintained by the CME.	Yes. The CPA is located in Kenya. The CME has maintained database of CPAs with each CPA assigned a number
Non-renewable biomass use	It can be shown that non-renewable biomass has been used since 31 December 1989, within the geographic boundary (Ghana and Kenya and later if included, other Sub-Saharan African Countries) where CPA is implemented	Published independent data at the geographic country boundary level.	Yes According to FAO Forest Resource Assessment, 2010, the forested area in Kenya reduced by 0.35 % between 1990 and 2000, by 0.34% between 2000 and 2005 and by 0.31% between 2005 and 2010. Therefore, between 1990 and 2010, Kenya lost its forests at an average rate of 0.32% per year. In total, between 1990 and 2010, Kenya lost 6.5% of its forest cover ⁷ .
Conditions that avoid double counting of ECSs and CPAs.	i. ECSs A unique serial numbering or identification system for the stoves disseminated	The specific numbering or identification regime is included in the specific CPA-DD. This	Yes. The stoves being distributed have a unique serial number

⁶ <http://www.kenyaforestservice.org/documents/redd/Charcoal%20Value%20Chain%20Analysis.pdf>

⁷ <http://www.fao.org/docrep/013/i1757e/i1757e.pdf>

	<p>is applied. The serial number will be traceable to the following:</p> <ol style="list-style-type: none"> 1. Programme identification 2. The CPA and its location 3. Acronym of project participants <p>ii. CPAs The CPA is exclusively bound to the PoA. Confirmation that the programme activity has not been and will not be registered either as a single CDM project activity or as a CPA under another PoA. The serial numbers are listed in the CME Database.</p> <p>The CPA shall not be proposed as an individual CDM project and/or as a part of any other CDM PoA and/or any other mechanism to avail climate change mitigation benefits.</p>	<p>shall be verified against the first stove sales receipt (first CPA of PoA).</p> <p>A statement is included in the CPA-DD that the specific CPA will not be part of another single CDM project activity or CPA under another PoA.</p> <p>This will be checked and verified with the UNFCCC, Gold Standard and Voluntary Carbon Standard websites with date of access. Confirmation from the CPA Implementer to the CME that the CPA has/shall not been proposed as an individual CDM project and/or as a part of any other CDM PoA and/or any other mechanism to avail climate change mitigation benefits.</p> <p>CME database</p> <p>The specific numbering or identification regime is included in the specific CPA-DD</p> <p>Document: First stove sales receipt (first CPA of PoA)</p>	<p>which is identifiable to the proposed CPA. The serial numbers are recorded and archived in a project database.</p> <p>ClimateCare has confirmed that the CPA has and shall not be proposed as an individual CDM project or as a part of any other CDM PoA and/or any other mechanism to avail climate change mitigation benefits.</p> <p>The CME confirms that the project has been checked and it is not being registered with any other climate change mitigation schemes both compliance and voluntary markets. The registries were accessed on 08/06/2016.</p> <p>The specific numbering/identification regime used in the specific CPA-DD is explained in section A.7</p>
The specifications of technology/measure and performance level	<p>Improved cookstove has a minimum efficiency of 20%. Stoves shall be tested annually for continued performance</p> <p>The efficiency of the project systems to be certified by a national standards body or an appropriate certifying</p>	<p>Technical specifications of the project stoves provided by means of efficiency test reports provided by independent testers Water Boiling Test (WBT) on annual basis.</p>	<p>Yes.</p> <p>The test results for the efficiency of the stove shows that the stove has a thermal efficiency of 44.9% and uses charcoal as fuel.</p> <p>The test was done by Kenya Industrial</p>

	agent recognized by it. Alternatively, manufacturer specifications on efficiency based on water boiling test (WBT) may be used.	Evidence that the stove tester is the national body or a body recognised by it or manufacturer specifications on efficiency based on water boiling test (WBT).	Research and Development Institute (KIRDI).
Conditions to check the start date	The CPA start date shall be after the PoA validation start following a successful pilot phase.	The start date of the CPA will be specified in each CPA-DD and appropriate supporting documents for the start date as per CDM definition shall be provided	Yes. The start date of the CPA is 26/02/2014, while the PoA was registered on 30 Nov 12. ClimateCare Ltd and DfID entered into agreement on 26 th Feb 2014 for the release of funds to set up the rolling fund that will enable the implementation of the CPA. This date represents the date of financial closure of the CPA and was the earliest date of implementation or real action on the project.
The conditions that ensure that CPAs meet the additionality requirements	Each CPA will demonstrate the additionality by establishing that in the absence of CDM PoA, the CPA would not occur a positive list of technology and project activity types that are defined as automatically. Barrier Analysis will be done in accordance with the latest versions of the "Guidelines on the demonstration of additionality of small-scale project activities, ver 10.0, EB 83, Annex 14" and the "Standard for the demonstration of additionality, development of eligibility criteria and application of multiple methodologies	The additionality of CPA03 has been demonstrated in CPA03-DD (See this section below)	Yes The proposed CPA distributes efficient cooking stoves for the household and the size of each unit is no larger than 5 % (only 0.001%) of the small-scale CDM threshold. Thus, in accordance to the paragraph 2 point (c) the Guidelines on the demonstration of additionality of small-scale project activities v9.0,EB 68, Annex 27 the project activity meets the condition for deemed additionality and therefore the project has been considered additional.

	<p>for Programme of Activities”.</p> <p>The country in which the CPA is to be implemented has no laws, policies or mandatory requirements stipulating the adoption of efficient charcoal cook-stoves and the CPA is a voluntary action by the PAI.</p>		
SSC limit for CPAs	<p>c. The annual energy savings of each CPA shall not exceed the limits of 180 GWh_{th}/year over the entire crediting period (Ref Clarification about the threshold of thermal energy savings in AMS-II.G (submitted 21 Sep 08); http://cdm.unfccc.int/filestorage/A/M/_/AM_CLAR_VIIC5MTUUR9PRPJL0EXOT3G2CKSFQ/Response%20SSC%20WG%20provided.pdf?t=a3F8bWFhaWJwfDDgR6TVWAKpcLVnwbAqV3mr</p> <p>At the time of joining the PoA, the maximum number of stoves required to reach the SSC threshold shall be determined and documented in the CPA-DD. Once the maximum number of appliances under the threshold is reached (or before, as deemed appropriate), the CPA shall be closed and, depending on the circumstances, a new CPA may be started to accommodate any new stoves sold.</p>	<p>GHG emission reduction calculation spreadsheet for the CPA.</p> <p>CPA-DD</p>	<p>The CPA does not exceed the small-scale limit. The GHG emission reduction calculation spreadsheet for the CPA03, outlines the maximum number of stoves required to reach the limit and at the same time, the sheet has a database of all stoves sold under the project.</p> <p>The maximum number of stoves required to reach the limit is 82,368 stoves.</p>

Exception from de-bundling rules	<p>Each ECS shall reduce energy consumption by less than 1.8GWh_{th}/year⁸.</p> <p>At the time of joining the PoA, the energy saving per stove shall be determined and verified by the CME as not greater than 1.8 GWh_{th}/year (1% of 180 GWh_{th}/year). Only CPAs meeting this criterion will be listed in the PoA and the actual unit ECS energy saving will be documented in the CPA-DD.</p>	<p>GHG emission reduction calculation spreadsheet for the CPA</p> <p>CPA-DD</p>	<p>Yes</p> <p>The CPA has not be de-bundled as confirmed in Section A.12 of the CPA-DD.</p> <p>The GHG emission reduction calculation spreadsheet for the CPA shows that the energy saving by the stove is 0.0022%.</p>
Carbon rights ownership	The CPA Implementer shall cede the rights for issuance of the CERs to the CME	Authorisation from the CPA Implementer to the CME.	<p>Yes</p> <p>The CME has signed contractual agreement for the transfer of Carbon Rights with PAI and stove manufacturers.</p> <p>The Project Activity Implementer for this project is ClimateCare who also are the CME for the project.</p>
The PoA-specific requirements stipulated by the CME including any conditions related to undertaking local stakeholder consultations and environmental impact analysis	<p>Each CPA shall conduct a local stakeholder consultation process for informing the various relevant stakeholders and obtaining feedback and comments on the CPA as specified in section F of the PoA-DD. Further details are presented in section C of the CPA-DD. The consultations shall meet CDM requirements.</p> <p>Environmental Impact Analysis (EIA) is not</p>	<p>The Local Stakeholder Consultation Report/minutes</p> <p>Local approval/license of the CPA by the host country environmental regulatory authority</p> <p>PoA Joining Agreement EIA License/Approval</p>	<p>Yes.</p> <p>Four stakeholder Consultation were conducted and minutes of the meeting prepared.</p> <p>The projected does not require to carry out an EIA as per Second Schedule of the Environment Management and Coordination Act 1999.</p>

⁸ According to the "Guidelines on assessment of debundling for SSC project activities, v03 (EB 54, Annex 13, par. 10) for determining the occurrence of debundling under a Programme of Activities (PoA)", if each of the independent subsystem/measures included in the CPA of a PoA is not larger than 1% of the small scale threshold defined by the methodology applied, then that CPA of the PoA is exempted from performing de-bundling check, i.e. considered as being not a de-bundled component of a large scale activity

	required to be conducted for CPAs under the PoA. Evidence will be provided that the CPA is exempt from undertaking the Environmental impact analysis (EIA) at CPA level. Where such evidence is not available, an EIA will be conducted at the CPA level.		
Documentation	The CPA is described appropriately in a CPA-DD document which is approved by the CME and validated by the DOE assigned by the CME	The CPA-DD for the specific CPA.	Yes. The CPA03 has been described appropriately in a CPA-DD.
Non-diversion of ODA/Non-use of Public Funding	The CPA confirms that funding from Annex 1 parties, if any, does not result in a diversion of official development assistance.	Confirmation by CPA implementer/CME in the CPA03-DD and evidence of funding sources.	Yes. Confirmation by CPA implementer/CME in the CPA03-DD and evidence of funding sources. See Section A.11. The CPA has received some funding from DFID to subsidise the stove purchase price and set up loan revolving fund. However, CERs from the CPA will not be used or be claimed by annex 1 country and this will not result in a diversion of ODA.
Where applicable, target group (e.g. domestic/commercial/industrial, rural/urban, grid connected/off-grid) and distribution mechanisms (e.g. direct installation)	The target group will be households, commercial user and institutions using inefficient charcoal stoves for cooking using non-renewable biomass in urban areas. The beneficiaries will be identified based on the any identification cards given to the households by the government, where available, phone numbers and otherwise the name of the stove purchaser will be stated. Also, the name of the	This CPA will distribute charcoal stoves for domestic and commercial use. Document: Stove Sales Database Business plan and distribution model. Documentation of the common practice of fuel usage for cooking in the project areas e.g. based on representative sample	Yes. This CPA will distribute charcoal stoves for domestic use only. Document: Stove Sales Database records are being generated and kept by the PAI and copy sent to CME as per contractual agreement signed. Business plan and

	area/locality or town will be recorded.	surveys, official data or peer reviewed literature	distribution model, or project viability plan. Documentation of the common practice of fuel usage for cooking in the project areas e.g. based on representative sample surveys, official data or peer reviewed literature)
Where applicable, the conditions related to sampling requirements for a PoA in accordance with the approved guidelines/standard from the Board pertaining to sampling and surveys	Each CPA will conduct sampling & surveying as appropriate or applicable based on requirements of: i. Sampling and survey methods described in the approved methodology AMS II.G, version 04.0, Energy efficiency measures in thermal applications of non-renewable biomass. ii. "Standard for sampling and surveys for CDM project activities and programme of activities", version 03.0, Annex 4, EB 69	The CPA monitoring plan in the specific CPA-DD	Yes. The CPA monitoring plan has been outlined clearly in the CPA-DD with specific roles and responsibilities. A sampling plan has also be established and detailed.

Confirmation of additionality for the CPA for Inclusion into the PoA

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The CPA demonstrates additionality by demonstrating that its "Project activities area 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" in accordance with EB 83, Annex 14.

The proposed CPA distributes efficient cooking stoves for the household and the size of each unit is no larger than 5 % (only 0.01%) of the small-scale CDM threshold. Thus, in accordance to the paragraph 11 point (c) of EB 83, Annex 14 the project activity meets the condition for deemed additionality and therefore the project has been considered additional.

D.6. Estimation of emission reductions

D.6.1. Explanation of methodological choices

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The emission reductions will be estimated and measured by application of the following options within AMS II.G, version 04.0.

Baseline

According to the methodology applied, 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 (Paragraph 4 of AMS-II.G, Version 04.0).

Therefore, the emission reductions achieved by a typical CPA will be calculated ex-ante as per AMS IIG, Version 04.0 as follows:

$$ER_y = B_{y,savings} * f_{NRB,y} * NCV_{biomass} * EF_{projected_fossilfuel} \quad (1)$$

Where:

ER_y	Emission reductions during the year y in tCO ₂ e
$B_{y,savings}$	Quantity of woody biomass that is saved by the CPA in period y in tonnes.
$f_{NRB,y}$	Fraction of woody biomass saved by the project activity in period y that can be established as non-renewable biomass in %.
$NCV_{biomass}$	Net calorific value of the non-renewable woody biomass that is substituted (IPCC default for wood fuel, 0.015 TJ/tonne)
$EF_{projected_fossilfuel}$	Emission factor for the substitution of non-renewable woody biomass by similar consumers. Use a value of 81.6 tCO ₂ /TJ ⁹

Quantity of woody biomass that is saved is estimated using Option 2 as follows:

$$B_{y,savings} = (B_{old} * (1 - \eta_{old} / \eta_{new})) \quad (3)$$

Where:

$B_{y,saving}$	The quantity of woody biomass that is saved by project activity in period y in tonnes.
B_{old}	<p>Quantity of woody biomass used in the absence of the project activity in tonnes</p> <p>B_{old} is determined as the product of number of appliances in use during the year and the average annual fuel combustion per baseline appliance.</p> <p>To determine B_{old}, the baseline charcoal consumption is multiplied by 6. This is based on last the paragraph of page 1.45 of the <i>Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories: Reference Manual</i>¹⁰, which states as follows:</p> <p><i>"If no local information is available, 6 kg of wood input per kg of charcoal may be used as default (FAO, 1990)".</i></p>

⁹ 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)).

¹⁰ See <http://www.ipcc-nggip.iges.or.jp/public/gl/guidelin/ch1ref3.pdf>

η_{old}	Efficiency of the system being replaced, measured using representative sampling methods (fraction). The default value provided in AMS-II.G, vers. 04.0 of 0.20 has been applied for the CPA
η_{new}	Efficiency of the system being deployed as part of the project activity (fraction), as determined using the Water Boiling Test (WBT) protocol.

The thermal energy baseline has been derived using historical data applicable for Kenya. Using data from a research carried out by Camco Advisory Services (Kenya) Limited in 2013 for Kenya Forest Services (KFS), titled “Analysis of the charcoal value chain in Kenya”¹¹, it was established that per capita charcoal consumption is actually higher in the rural areas than in urban areas i.e., 156kg compared to 152kg in urban areas.

Since the projects sites are located in peri-urban areas, the project participants have applied the urban charcoal consumption in calculating the B_{old} . Using an average household size for Naivasha and Timau of 3.69¹², the annual charcoal consumption by household is calculated to be 0.5609 tonnes/year of charcoal. The charcoal is converted to woody biomass by multiplying it with a factor of 6 to get 3.37 tonnes/year.

In order to derive B_{old} from the baseline fuel use survey, a parameter representing the average annual consumption of woody biomass per baseline stove ($B_{old, appliance}$) and the average annual consumption of charcoal per baseline appliance ($B_{old, appliance, survey}$) have been introduced. Also, the following “own” equation has been introduced to account for the leakages due to the NRB (L_{NRB}) and the PoA (L_{POA}), and also to convert from quantity of charcoal to quantity of biomass (multiply by 6).¹³

$$B_{old, appliance} = B_{old, appliance, survey} * 6 * L_{NRB} * L_{POA} \quad (3.1)$$

Where:

$B_{old, appliance}$	The average quantity of woody biomass used in the absence of the project activity by each appliance in tonnes.
$B_{old, appliance, survey}$	The average quantity of charcoal used in the absence of the project activity by each appliance in tonnes as determined from the baseline survey (See the Baseline Study Report)
L_{NRB}	Leakage factor as per Clause 13(a) of AMS-II.G, Version 04.0. Use a value of 0.95 (As per AMS-II.G). There will be no transfer or use of old equipment from outside the project boundary.
L_{POA}	Leakage factor as per Clause 23(c) of AMS-II.G, Version 04.0. Use a value of 0.95 (As per AMS-II.G). There will be no transfer or use of old equipment from outside the project boundary.

To determine the number of appliances in use in year y (N_y) for ex-ante calculations, an average stove life of 4 years and a dropout rate (DO_y) of 5% are assumed. For ex-post calculations, drop-off rate will be statistically determined. To compensate for the actual operating days for a given

¹¹ <http://www.kenyaforestservice.org/documents/redd/Charcoal%20Value%20Chain%20Analysis.pdf>

¹² <https://www.opendata.go.ke/Population/2009-Census-Vol-1-B-Table-1-Population-and-Density/j2vg-i63y> and http://www.knbs.or.ke/index.php?option=com_content&view=article&id=176&Itemid=645

¹³ To determine B_{old} , the baseline charcoal consumption is multiplied by 6. This is based on last paragraph of page 1.45 of the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories: Reference Manual¹³, which states as follows: “If no local information is available, 6 kg of wood input per kg of charcoal may be used as default (FAO, 1990)”.

stove, N_y is further adjusted for the proportion of the year during which the stoves are in use using the factor, $mp_{length}/365$ (where mp_{length} is the number of days the a stove is in use during the year). The number of stoves in use, assuming a 4-year life, ($N_{y, no-adjusted}$) is then adjusted for the drop using the equation:

$$N_y = N_{y, non-adjusted} * (1 - DO_y) * mp_{length} / 365 \quad (3.2)$$

For ex-ante calculations, mp_{length} is assumed to be 365 days.

The quantity of woody biomass that is saved by the CPA in period y in tonnes is then calculated from the equation (3.2) below in order to correct for drop-out rate and days of use.

$$B_{y, savings} = B_{y, savings, appliance} * N_y * DO_y \quad (3.2)$$

Where:

$B_{y, savings}$	Quantity of woody biomass that is saved by the CPA in period y in tonnes.
$B_{y, saving, appliance}$	The average quantity of woody biomass that is saved by each project appliance in period y in tonnes.
$N_{y, non-adjusted}$	The number of ECS in operation in year y before adjustment for the stoves not in use. The value of $N_{y, non-adjusted}$ depends on the sales rate and the expiry rate of the project stoves and is designed to ensure that the number of operational stoves does not exceed the energy-saving threshold prescribed for Type II methodologies. $N_{y, non-adjusted}$ will be adjusted according to the share of users found not to use the project stoves by applying a Drop-Out Rate Factor (DO_y) as in equation (3.2) to determine N_y .
N_y	The number of ECS in operation in year y adjusted for the stoves not in use.
DO_y	The percentage of stoves sold by the PAI which are no longer in use (Drop-Out Rate). As per paragraph 16 of AMS IIG, the percentage of stoves sold by the PAI which are no longer in use (the Drop-Out Rate, DO_y), will be found by sampling. This sample will be biennial or annually
mp_{length}	Length of monitoring period. For ex-ante calculations, a value 365 days per year is assumed.

In addition, the ex-post Kitchen surveys will also investigate the extent to which baseline stoves continue to be used. The surveys will determine if baseline stoves are found to be in use and if so, the biomass fuel consumption of those stoves shall be excluded from B_{old} . The survey will be done through use of questionnaires, where sampled households will be visited and checked if they still retained/have the baseline stove in their Kitchen. Those found to have them, will then be asked to state how often they use them (per day, week, month or year). The data collected will then be analysed and a usage factor of baseline stoves be determined. The values arrived at will then be used to calculate B_{old} per project stove for those households using baselines stoves in the ER calculation.

Sampling will be undertaken as part of a Sampling Plan that is in line with the requirements of AMS II.G Vers.04.0 and the "Standard for sampling and surveys for CDM project activities and programme of activities", version 03.0, EB 69, Annex 4. Wherever reasonably possible, the PoA Sampling Plan will ensure that sample sizes are large enough to meet 95/5 precision in the case of biannual sampling, and 90/10 precision in the case of annual sampling. In cases where such precision is not achieved, the lower bound of a 90%/95% confidence interval of the parameter value will be used as allowed by the methodology.

The registered PoA-DD states that “*depending on the CPAs that are included in the PoA, simple random sampling may be appropriate; in other cases stratified random sampling may be more appropriate. The CME will provide guidance to the CPA implementer and/or any other parties that will be involved in carrying out sampling activities as part of the monitoring plan*”.

For the purposes of this CPA, the CME has provided guidance that since the stoves being distributed are of same design and size and are used for domestic purposes, the sampling to be used will be simple random sampling, since the stoves will be classified as one/single strata. Therefore, the CPA will utilise simple random sampling when carrying out all types of surveys. However, if a different type of stoves are included in the CPA, then each stove types will form a strata, where simple random sampling will be applied in each strata to draw a sample.

Fraction of Non-Renewable Biomass

In the registered PoA-DD, the fraction of non-renewable biomass (f_{NRB}) is to be either determined from the default values endorsed by designated national authorities and approved by the Board that are available at <http://cdm.unfccc.int/DNA/fNRB/index.html> or be calculated in accordance with the “Information note; Default values of fraction of non-renewable biomass for least developed countries and small island developing states, version 01.0 (EB 67, Annex 22).

For the purposes of this CPA03, the project has applied a default value of 92% for non-renewable fraction of Kenya which has been endorsed by Kenyan DNA and approved by the CDM EB¹⁴.

D.6.2. Data and parameters fixed ex-ante

Data / Parameter	η_{old}
Unit	Fraction
Description	Efficiency of the system being replaced, measured using representative sampling methods or based on referenced literature values (fraction), use weighted average values if more than one type of system is being replaced
Source of data	Default value in AMS-II.G, vers 04.0
Value(s) applied	0.20
Choice of data or Measurement methods and procedures	According to the methodology, 0.10 default value may be optionally used if the replaced system is the three stone fire or a conventional system lacking improved combustion air supply mechanism and flue gas ventilation system i.e. without a grate and without a chimney; for other types of systems a default value of 0.2 may be optionally used The replaced systems in the project area will be other stove types which has some element of improved efficiency.
Purpose of data	Calculation of baseline emissions
Additional comment	-

Data / Parameter	L_{POA}
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¹⁴ <http://cdm.unfccc.int/DNA/fNRB/index.html> accessed on 07/03/2016

Unit	-
Description	Net-to-gross adjustment factor for PoA Leakage (fixed parametric value of 0.95)
Source of data	AMS-II.G; Version 04.0
Value(s) applied	0.95
Choice of data or Measurement methods and procedures	As per the methodology AMS II.G, vers. 04.0, a default value as provided under par. 22 can be optionally used to account for PoA leakage, in which case estimates of the leakage are not required. See Part II, Section B.6.1 of this document for details.
Purpose of data	Calculation of leakage
Additional comment	The 0.95 PoA leakage factor will be applied to all CPAs

Data / Parameter	$EF_{projected_fossilfuel}$
Unit	tCO ₂ /TJ
Description	Emission factor for the substitution of non-renewable biomass by similar consumers
Source of data	AMS-II.G; vers. 04.0
Value(s) applied	81.6
Choice of data or Measurement methods and procedures	This is the IPCC default value as provided by AMS II.G (vers. 04.0), paragraph 5
Purpose of data	Calculation of baseline
Additional comment	-

Data / Parameter	$NCV_{biomass}$
Unit	TJ/tonne
Description	Net calorific value of the non-renewable woody biomass that is substituted
Source of data	AMS-II.G; vers. 04.0
Value(s) applied	0.015
Choice of data or Measurement methods and procedures	This is the IPCC default value for non-renewable woody biomass that is substituted as provided by AMS II.G (vers. 04.0), paragraph 5.
Purpose of data	Calculation of baseline
Additional comment	-

Data / Parameter	$f_{NRB,y}$
Unit	-
Description	Fraction of woody biomass saved by the project activity in period y that can be established as non-renewable biomass in %.
Source of data	Default values as published by EB and approved by local DNA http://cdm.unfccc.int/DNA/fNRB/index.html
Value(s) applied	92%
Choice of data or Measurement methods and procedures	Default values ¹⁴
Purpose of data	Once, at the time of inclusion of a CPA into the PoA.

Additional comment	Use of nationally approved source of data
	Calculation of baseline emissions
	-

Data / Parameter	$B_{old, appliance, survey}$
Unit	Tonnes per stove
Description	Quantity of charcoal used in the absence of the project activity per appliance(stove)
Source of data	Derived from local historical published data
Value(s) applied	0.56
Measurement methods and procedures	$B_{old, appliance, survey}$ is determined through review of published data as per paragraph 7(a) of the methodology. B_{old} is calculated from $B_{old, appliance, survey}$
Monitoring frequency	Determined once before the start of the crediting period
QA/QC procedures	Use of nationally approved source of data
Purpose of data	Calculation of baseline emissions
Additional comment	This parameter is determined once for each region where the stoves are to be sold. The whole country has been considered a region, since the CPA covers the entire host country of Kenya, $B_{old, appliance, survey}$ is determined using national charcoal consumption values.

Data / Parameter:	L_{NRB}
Data unit	-
Description	Net-to-gross adjustment factor for NRB Leakage (fixed parametric value of 0.95)
Source of data	AMS-II.G; Version 04.0
Value(s) applied	0.95
Measurement methods and procedures	As per the methodology AMS II.G, vers. 04.0, a default value as provided under par. 13 can be optionally used to account for NRB leakage, in which case surveys are not required. See Part II, Section B.6.1 of this document for details.
Purpose of data	Calculation of leakage
Additional comment:	The 0.95 PoA leakage factor will be applied to all CPAs

D.6.3. Ex-ante calculation of emission reductions

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The emission reductions achieved by the CPA03 will be calculated ex-ante as per AMS IIG, vers. 04.0 as follows:

$$ER_y = B_{y,savings} * f_{NRB,y} * NCV_{biomass} * EF_{projected_fossilfuel} \quad (1)$$

Where:

Parameter	Description	Value
ER_y	Emission reductions during the year y in tCO ₂ e	See ER sheet for values
$B_{y,savings,appliance}$	Quantity of woody biomass that is saved by the each device in period y in tonnes.	1.6

$f_{NRB,y}$	Fraction of woody biomass saved by the project activity in period y that can be established as non-renewable biomass in %.	0.92
$NCV_{biomass}$	Net calorific value of the non-renewable woody biomass that is substituted in TJ/tonne (IPCC default for wood fuel, 0.015 TJ/tonne)	0.015
$EF_{projected_fossilfuel}$	Emission factor for the substitution of non-renewable woody biomass by similar consumers in tCO ₂ /TJ. Use a value of 81.6 tCO ₂ /TJ ¹⁵	81.6

Quantity of woody biomass that is saved by each appliance is estimated using Option 2 as follows:

$$B_{y, savings, appliance} = B_{old} * (1 - \eta_{old} / \eta_{new}) \quad (3)$$

Parameter	Description	Value
$B_{y, savings}$	The quantity of woody biomass that is saved in period y in tonnes.	1.6
B_{old}	Quantity of woody biomass used in the absence of the project activity in tonnes	3.37
η_{old}	Efficiency of the system being replaced, measured using representative sampling methods (fraction). The default value of 0.20 has been applied for the CPA	0.2
η_{new}	Efficiency of the system being deployed as part of the project activity (fraction), as determined using the Water Boiling Test (WBT) protocol. Use weighted average values since 3 sizes of stoves are being introduced by the project activity.	0.449

The quantity of woody biomass that is saved by the CPA03 in period y in tonnes is then calculated from the equation (3.2) below in order to correct for drop-out rate and days of use.

$$B_{y, savings} = B_{y, appliance} * 6 * L_{NRB} * L_{POA} * N_y \quad (3.2)$$

$$\text{and } N_y = N_{y, non-adjusted} * (1 - DO_y) \quad (3.2.1)$$

Where:

Parameter	Description	Value
B_{old}	Quantity of woody biomass used in the absence of the project activity in tonnes	3.37
$B_{y, appliance}$	The average quantity of charcoal that is consumed by each baseline stove in period y in tonnes.	0.56
$N_{y, non-adjusted}$	The number of ECS in operation in year y before adjustment for the stoves not in use. The value of $N_{y, non-adjusted}$ depends on the	1

¹⁵ 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)).

	sales rate and the expiry rate of the project stoves and is designed to ensure that the number of operational stoves does not exceed the energy-saving threshold prescribed for Type II methodologies. $N_{y, non-adjusted}$ will be adjusted according to the share of users found not to use the project stoves by applying a Drop-Out Rate Factor (DO_y) as in equation (3.2.1) to determine N_y .	
N_y	The number of ECS in operation in year y adjusted for the stoves not in use.	1
DO_y	The percentage of stoves sold by the PAI which are no longer in use (Drop-Out Rate). As per paragraph 16 of AMS IIG, the percentage of stoves sold by the PAI which are no longer in use (the Drop-Out Rate, DO_y), will be found by sampling. This sample will be biennial or annually	0.05
mp_{length}	Length of monitoring period. For ex-ante calculations, a value 365 days per year is assumed	365

D.6.4. Summary of the ex-ante estimates of emission reductions

Year	Baseline emissions (t CO ₂ e)	Project emissions (t CO ₂ e)	Leakage (t CO ₂ e)	Emission reductions (t CO ₂ e)
2016	26,725	1,331	963	10,307
2017	70,641	3,518	2,544	27,244
2018	104,347	5,196	3,758	40,243
2019	140,160	6,980	5,048	54,055
2020	163,520	8,143	5,889	63,064
2021	175,200	8,725	6,310	67,569
2022	46,592	2,320	1,678	17,969
Total	727,184	36,213	26,190	280,450
Total number of crediting years	7			
Annual average over the crediting period	103,883	5,173	3,741	40,064

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

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D.7.1. Data and parameters to be monitored

Data / Parameter	Annual energy saving per appliance
Unit	GWh
Description	Annual energy saving per appliance
Source of data	Calculated from $B_{y,saving, appliance}$ and $NCV_{charcoal}$
Value(s) applied	0.0022
Measurement methods and procedures	Calculated as product of $B_{y,saving, appliance}$ and $NCV_{charcoal}$ (taken as 0.0295 TJ/t) divided by the conversion factor (TJ/GWh taken as 3.6 from IPCC 2006 Tables)
Monitoring frequency	Once, at the time of inclusion of a CPA into the PoA.
QA/QC procedures	Use of nationally approved source of data
Purpose of data	Calculation of baseline emissions

Additional comments	Used to verify that the de-bundling requirements are met
Data / Parameter	Annual number of appliances to reach small scale threshold
Unit	Number
Description	Annual number of appliances to reach small scale threshold
Source of data	Calculated from the annual energy saving per appliance
Value(s) applied	82,368
Measurement methods and procedures	Calculated as 180 divided by annual energy saving per appliance
Monitoring frequency	Once, at the time of inclusion of a CPA into the PoA.
QA/QC procedures	Use of nationally approved source of data
Purpose of data	Calculation of baseline emissions
Additional comments	Used to verify that the small scale threshold limit is not exceeded. The number of stoves will have to be updated if other stove designs are disseminated (in addition to the Jiko Koa) by the CPA.

Data / Parameter	B_{old}
Unit	Tonnes
Description	Quantity of woody biomass used in the absence of the project activity
Source of data	Calculated from $B_{old, appliance, survey}$ and N_y
Value(s) applied	3.37
Measurement methods and procedures	B_{old} is determined as the product below in order to correct for charcoal to biomass conversion, leakages, number of stoves in operation and the number of operational days; $B_{old, appliance, survey} * 6 * L_{NBR} * L_{POA} * N_y$
Monitoring frequency	Determined once before the start of the crediting period
QA/QC procedures	Use of nationally approved source of data
Purpose of data	Calculation of the baseline emission reductions
Additional comment	-

Data / Parameter	N_y
Unit	-
Description	Adjusted total number of stoves deployed until period y
Source of data	Sales Database
Value(s) applied	Refer spreadsheet
Measurement methods and procedures	The total number of stoves deployed until period y is calculated based on information monitored through the Sales Database. The deployment is based on the days the device is sold and entered into database
Monitoring frequency	Continuous
QA/QC procedures	Data will be collected using the standard procedures and will be kept for two years after the end of the crediting period or the last issuance of CERs for the activity, whichever occurs later.
Purpose of data	Calculation of baseline
Additional comments	Type of the stove will also be monitored via sampling approach or documented evidences, and in case any deployed ICS type will be found not in line with the methodology requirement, those ICS will not be counted for emission reduction calculations

Data / Parameter	DO_y
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Unit	%
Description	Statistically adjusted drop out from total population of appliances in period y Drop out means that the ECS are either not used, outside of the project boundary as defined in the CPA or damaged beyond repair.
Source of data	A survey of local project stove usage
Value(s) applied	5%
Measurement methods and procedures	<p>Monitoring of the statistically adjusted drop out involves two steps:</p> <p>Step 1: Sample survey amongst stoves of the same type deployed under CPAs of the PoA.</p> <p>Step 2: Calculation of the adjusted drop-out rate at confidence level and precision as required by the methodology (AMS II.G. ver. 04.0) for the inspection frequency chosen, following the statistical standard approach for a homogeneity test of independent units that have a standard normal distribution.</p> <p>The Drop outs will be determined through interviews and home visits where it will be checked if the appliances are still operational during the annual or biennial annual Kitchen Performance Testing (KPTs), performed according to the sampling procedure described in section Part II, B.7.2. Statistical sample will be drawn which meets the sampling requirements.</p> <p>Interviews will be reported in a questionnaire.</p> <p>Checks are conducted until the required precision for this parameter is achieved. All questionnaires and information gathered during the sampling by the survey team are handed over to the managing entity that maintains an electronic database</p>
Monitoring frequency	Done either biennially or annually for each CPA in the PoA
QA/QC procedures	<p>All formulas applied to determine the statistical precision are standard formula. According to AMS II.G (version 04.0), paragraph 21, if the required precision is not achieved, the lower bound of the required confidence interval of the parameter value is to be chosen.</p> <p>No deductions have to be made if the precision is achieved by sampling a proper number of appliances.</p> <p>Data will be collected using the standard procedures and will be kept for two years after the end of the crediting period or the last issuance of CERs for this project activity, whichever occurs later.</p> <p>A traceable "identity check" of the ECS visited during sampling shall be performed and recorded (e.g. a picture of the appliance clearly showing its serial no., etc.).</p>
Purpose of data	Calculation of baseline emissions
Additional comments	This parameter will be monitored for all CPAs and each CPA will choose monitor this parameter annually or biennially.

Data / Parameter	η_{new}
Unit	%
Description	Efficiency of the project stoves deployed as part of the project activity (fraction), as determined using the Water Boiling Test (WBT) protocol.
Source of data	Annual WBTs
Value(s) applied	44.9
Measurement methods and procedures	Water Boiling Test (WBT) protocol.
Monitoring frequency	Annually, as per of AMS II.G version 04.0

QA/QC procedures	Sampling and survey to be carried out with 90% confidence interval and a 10% margin of error. If results show that 90/10 precision is not achieved, the lower bound of 90% confidence interval of this parameter value will be applied.
Purpose of data	Calculation of baseline emissions
Additional comments	-

D.7.2. Description of the monitoring plan

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The parameters shown in Section D.7.1 are monitored. Monitoring and verification shall be by sampling, following the guidance provided in the “Standard for sampling and surveys for CDM project activities and Programme of Activities”, Version 03.0 and in accordance with the methodology AMS II.G, version 04.0.

Sales Records

N_y is monitored through the Sales Database for all the ECS deployed, which are maintained electronically by the PAI and are periodically checked by the CME to ensure there is no double counting. In order to ensure completeness and accuracy of monitoring information, electronic database(s) will be operated and maintained by PAI. This information will further be maintained by the CME who may verify the reported sales with the number of stoves produced by the manufacturer. Since the unique code inscribed on the cook stoves will correspond to its CPA, the occurrence of double counting can be avoided.

The database will also serve as the basis for the calculation of CERs since it will contain all information regarding the user. It will contain the dates each stove is sold to end users and this will help in determining the lag time accounted for each stove in calculation of emission reductions. The PAI will collect sales data for each stove sold. The dates will be entered in the excel sheet sales database. This parameter is key in identifying the lag time during ER calculation.

In order to account for the lag time between the date of stove sale to the end user and the date of first use of the stoves by the end user, which is assumed to be one day, a 1 day lag time is considered for the purposes of the ex-ante estimation of emission reductions. In the ER spreadsheet, calculation of days in operation is done using excel sheet which return a value which is less by 1. For example, if the period of monitoring in 01/01/2015-31/12/2015, using excel, the formula for determining the number of days is achieved by minus the newer date from the older date to return the number of days, for example ($=31/12/2015 - 01/01/2015$), one gets 364 days instead of 365. Since all ER calculations are done using excel, the one day lag time is accounted for.

Monitoring Efficiency

In compliance with paragraphs 15, 16 and 21 of AMS II.G, Version 04.0, and on annual basis, the efficiency of representative sample of all ECS under the CPA will be determined by sampling and testing the sampled CPA stoves for efficiency in order to ensure that the ECSs are still operating at the specified efficiency (η_{new}) or that they are replaced by an equivalent service stove. Only new stoves with efficiency commensurate or better than the continuing efficiency will be included for carbon calculations.

Efficiency monitoring for the CPA will be the responsibility of the PAI with close supervision of the CME.

Biomass Savings

On an annual basis, the biomass saving ($B_{y, savings}$) realised by the CPA shall be estimated by use of historical data from published literature. By applying the data gathered, the average biomass

used per project stove ($B_{y, new, appliance}$) will be determined. The total quantity of the woody biomass used during the project activity ($B_{y, new}$) and the biomass saving ($B_{y, savings}$) will then be calculated from ($B_{y, new, appliance}$) and the number of ECS still in use (N_y). The data gathering and review will be the responsibility of the CME.

A survey to determine use of baseline stove by household will be carried out through use of questionnaires, where sampled households will be visited and checked if they still retained/have the baseline stove in their Kitchen. Those found to have them, will then be asked to state how often they use them (per day, week, month or year). The data collected will then be analysed and a usage factor of baseline stoves be determined. The values arrived at will then be used to calculate B_{old} per stove project stove for those households using baseline stoves in the ER calculation.

In order to determine $B_{y, savings}$, the value of $B_{old, appliancesurvey}$ will not be monitored, but will be determined using Paragraph 7(a) of AMS IIG, vers 04.0, i.e. historical data, and prior to validation of the CPA.

Monitoring Ongoing Usage

The percentage of stoves sold by the PAI which are no longer in use, the Drop-Out Rate, (DO_y) will be determined by sampling on a biennial basis. The number of stoves in use will be adjusted by the Drop-Out Rate in order to determine the number of project stoves in use, (N_y) and to calculate the emission reductions. The drop off monitoring will be the responsibility of the CME.

Monitoring leakage:

Provisions have been made for both the leakage due to the use of non-renewable woody biomass saved under the project activity (L_{NRB}) and due to the PoA for the use of non-renewable woody biomass outside the project boundary to create non-renewable woody biomass baselines (L_{POA}).

As provided for in AMS-II.G, vers. 04.0 ; B_{old} can be multiplied by a net to gross adjustment factor of 0.95 to account for leakages, in which case surveys are not required. The net to gross adjustment factor of 0.95 to account for leakages will be used by the PoA for accounting leakages.

In order to control costs, sampling may be across CPAs deploying the same ECS type since this will not affect the precision/ confidence requirements of the methodology, as long as the inspection frequency is met. The values of the sampled parameter identified above will be found according to 90/10 precision for annual sampling, 95/5 for biennial sampling, or lower bound.

Sampling method

Stratified sampling is to be applied where the Stoves will be categorised into strata. Since the CPA distribute medium stoves for domestic use, all the stoves will form one strata. However, in situations where more than one stove type is disseminated by the CPA, then each stove designs disseminated will form a strata. From the strata, simple random sample will be applied in picking out samples.

Sample size

The sample size for surveys will be determined as per *The Guidelines for Sampling and Surveys for CDM Project Activities and Programme of Activities*, Version 02.0 (EB 69, Annex 5) using the following formula for stratified random sampling:

$$n \geq t^2 \cdot N \cdot (SD^2/p^2) / (((N-1) \cdot 0.1^2) + (t^2 \cdot (SD^2/p^2)))$$

Where:

n	292	Minimum size of the sample
N	82,368	Size of the population (maximum number of stoves required to reach small-scale threshold)
t	1.96	Confidence interval (taken as 1.645 and 1.96 for 90% and 95% confidence intervals, respectively)
p	0.95	Population proportion, set at 0.86 (the proportion of stoves still in use after 1 years assuming an annual drop off rate of 5%)
l	0.1	Sets the acceptable margin of error, at 0.1 where annual monitoring is applied and 0.05 where biennial monitoring is applied
SD	0.83	Overall variance (calculated)

To account for non-response, and based on previous experience n is divided by 0.8 (default response rate).

For stove efficiency tests, if the efficient cook-stoves are produced by a manufacturer with a good quality management system in place to ensure that the individual equipment produced do not vary beyond the range of acceptance limits, a sample test on three cook stoves with three tests for each stove will be conducted. If the standard deviation of the nine test results indicated above is very small and 90/10 precision requirement is met, the efficiency determined is acceptable, otherwise more sample tests would be required until 90/10 precision is met.

Sampling frame

The sample will be drawn from the stoves sales database, stratified by type of users i.e, domestic households who form a single strata. From the single strata of users, the selection will be random from the CPA database. Once a number of samples are selected in each strata, the owner or the responsible person in the household selected will be contacted.

Quality assurance / quality control

The CPA database will be prepared by PAI and be submitted to CME for quality check to ensure consistency and for archiving. The CME will use the database for sampling purposes and it's the CE and PAI who will be responsible for choosing personnel to be involved in carrying out the sampling and data collection. The personnel will be selected based on their academic qualification and be given training on questionnaire administration and data reading and recording.

Households who have been sampled will be contacted beforehand to secure their willingness to participate in the surveys. This ensures smooth running of the exercise and at same time to get enough samples.

Implementation plan

The sampling will be done by qualified personnel from both CME, PAI and monitoring team. All the personnel who will be involved will have knowledge and experience in conducting sampling exercises and data collection and analysis.

SECTION E. Approval and authorization

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Approval for the CPA has been provided by the Kenyan DNA.

Appendix 1. Contact information of CPA implementer(s) and responsible person(s)/ entity(ies) for completing the CDM-SSC-CPA-DD-FORM

CPA implementer and/or responsible person/ entity	<input checked="" type="checkbox"/> CPA implementer(s) <input checked="" type="checkbox"/> Responsible person/ entity for completing the CDM-SSC-CPA-DD-FORM
Organization	ClimateCare Limited
Street/P.O. Box	Esplanade
Building	13-14
City	St. Helier
State/Region	Jersey
Postcode	JE1 1BD
Country	Channel Islands
Telephone	+44 (0) 1534 888 777
Fax	N/A
E-mail	mail@climatecare.org
Website	www.climatecare.org
Contact person	Tom Morton
Title	Director
Salutation	Mr.
Last name	Morton
Middle name	S.D.
First name	Tom
Department	Management
Mobile	+254 (0) 728 218 183
Direct fax	N/A
Direct tel.	+254 (0) 20 213 3604
Personal e-mail	tom.morton@climatecare.org

Appendix 2. Affirmation regarding public funding

This is not applicable as per Section A.11 of this CPA03-DD. Confirmation letter has been annexed separately.

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

See Section D.2 of this CPA03-DD

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

N/A

Appendix 5. Further background information on monitoring plan

N/A

Appendix 6. Summary of post registration changes

N/A

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Document information

<i>Version</i>	<i>Date</i>	<i>Description</i>
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: <ul style="list-style-type: none"> • Include provisions related to statement on erroneous inclusion of a CPA; • Include provisions related to delayed submission of a monitoring plan; • Provisions related to local stakeholder consultation; • Provisions related to the Host Party; • Editorial improvement.
03.0	25 June 2014	Revisions to: <ul style="list-style-type: none"> • Include the Attachment: Instructions for filling out the component project activity design document form for small-scale CDM component project activities (these instructions supersede the "Guidelines for completing the component project activity design document form for small-scale component project activities" (Version 01.0)); • Include provisions related to standardized baselines; • Add contact information on a CPA implementer and/or responsible person/ entity for completing the CDM-SSC-CPA-DD-FORM in A.14. and Appendix 1; • Add general instructions on post-registration changes in paragraph 4 and 5 of general instructions and Error! Reference source not found.; • Change the reference number from <i>F-CDM-SSC-CPA-DD</i> to <i>CDM-SSC-CPA-DD-FORM</i>; • Editorial improvement.
02.0	13 March 2012	EB 66, Annex 17 Revision required to ensure consistency with the "Guidelines for completing the component project design document form for small-scale component project activities".
01.0	27 July 2007	EB33, Annex44 Initial adoption.

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