Component project activity design document form
(Version 09.0)

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

BASIC INFORMATION	
Title of the CPA	CPA 042 – BioLite HomeStove in Kenya
Scale of the CPA	☐ Large-scale ☒ Small-scale
Version number of the CPA-DD	Version 3
Completion date of the CPA-DD	02/12/2019
Title and UNFCCC reference number of the registered CDM PoA	PoA 7997 - BioLite Improved Cook stoves Programme
Title and reference number of the corresponding generic CPA	CPA XXX - BioLite Improved Cook stoves Programme
Coordinating/managing entity	BioLite India Private Limited
Host Party	Kenya
Applied methodologies and standardized baselines	AMS II G, Energy efficiency measures in thermal applications of non-renewable biomass, version 03, ASB0035: Baseline woody biomass consumption for household cookstoves in Kenya (version 01.0)
Sectoral scopes	Sectoral Scope – 3; Energy Demand
Estimated amount of annual average GHG emission reductions	48,877 tons CO_2e

SECTION A. Description of component project activity (CPA)

A.1. Purpose and general description of CPA

The proposed small scale CDM Programme Activity "CPA 042 - BioLite HomeStove in Kenya" involves the distribution of domestic fuel efficient cook stoves by International Carbon Portfolio Ltd. (ICPL), a Korean company. ICPL provides all implementation and ongoing project operation costs for the development of the CPA, including total ICS purchase, distribution, and maintenance costs.

All CERs generated from this CPA will be for the benefit of the CPA Implementer – ICPL.

BioLite India Private Limited is the coordinating / managing entity of the PoA[1].

Based on the calculation of f_{NRB}, Kenya is a biomass deficient region[2]. Currently most people in Kenya are using the traditional cook stove for cooking i.e 3 stone stove or other rudimentary technology. This method is inefficient and leads to unsustainable non-renewable biomass use. The replacement of these inefficient stoves with improved efficient cook stove will lead to the reduction in biomass consumption, specifically the reduction of wood and charcoal.

This CPA 042 – "BioLite HomeStove in Kenya" follows the policy/measure or stated goal of the PoA, namely to deploy appropriate financial mechanisms using carbon revenues and other incentives, if any, to offset the capital cost of efficient cook stoves and make these accessible to more rural and/or urban households for sustainable use. Specifically, the programme will provide a framework to secure commitment from investors in addition to providing framework for distribution, capacity building, operation & maintenance to facilitate continuous use of efficient cook stoves. This measure or action is not mandated by any policy in Kenya and goes beyond the current levels of policy/regulations or compliance.

Documentation of this CPA is undertaken as required by the simplified modalities and procedures for small scale CDM project activities prescribed by UNFCCC/CDM EB for generation of emission reductions (ERs).

The CPA is considered a Type II project activity. The CPA Implementer is investing into the project through funds available for deploying such technologies, measures and devices of efficient cookstoves that save more than 50% biomass[3]. Such an investment is not mandatory and goes beyond the current levels of policy or regulation.

Contribution to sustainable development:
The programme is in line with Kenya national policies, since Kenya names improved cookstoves as among the key solutions to a heavy reliance on biomass fuels at the bottom of the energy ladder.[4]

By implementing this project the CPA, we achieve a series of key benefits related to social, environmental, economic and technological well being:

Social well being

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[1] http://cdm.unfccc.int/ProgrammeOfActivities/poa_db/YNXCPIJ5ZO7DTRGMV0F2AKEU486LQS/view

[2] *The fraction of non renewable biomass (fNRB) is determined based on the availability and demand of bio resources in the region. When fNRB value is greater than zero then the region comes under deficient biomass region as the demand exceeds availability. Also the fNRB value greater than zero results in higher emission reduction.*

[3] Calculated as $B_{ysavings}/B_{old}$ * 100. For this CPA biomass savings is 78% which is greater than 50%.

[4] National Energy Policy, Ministry of Energy and Petroleum, Republic of Kenya, February, 2014: http://www.ketraco.co.ke/opencms/export/sites/ketraco/news/Downloads/National_Energy_Policy_-_Final_Draft_-_27_Feb_2014.pdf

- Reduces drudgery to women (due to reduced fuel wood use) who spend about long hours and travel long distances to collect fuel wood.
- Improves women and children's overall health by reducing smoke in the kitchen, thus reducing health hazards from indoor air pollution.
- Improves cooking time – the materials used in the improved cook stove enables effective transmission of heat i.e. effective utilization of heat for cooking by minimizing conventional losses, improved combustion efficiency , minimizing soot formation & deposition on vessel surface (i.e. Heat transfer barrier) together aid in cooking the food faster
- Improves cooking environment due to less smoke and carbon residue in the kitchen
- Improves quality of life – the rural and/or urban communities get family time as the whole family can sit and eat together, especially given improved access to lighting since the stove generates enough electricity to power a small LED lamp.

Environmental well being

- Improves the local environment by reducing the rate of degradation of forests and deforestation in the project area.
- Reduces indoor air pollution – Improved cook stove emits less smoke and reduces both morbidity from respiratory diseases and other health hazards, as well as the medical expenditure involved. A resource-poor household would need to spend limited available finances on medicines, further exacerbated by loss of wages from both not being able to work and having to look after the ill person.
- Reduces global and local environmental pollution and environmental degradation by reduction in use of non-renewable biomass thus leading to reduction in GHG emissions.
- Utilises less water and effort needed for cleaning of vessels as the cooking process is relatively smoke free.
- Reduces kerosene fumes since lighting can be accomplished from the LED light on the stove

Economic well being

- Reduces time for collection of fuel wood resulting in productive engagement of time in alternate livelihood activity or engagement with community.
- Will reduce expenditure on purchase of fuel wood and alternate fuels thus increasing levels of income and simultaneously their standard of living.
- Creates alternative livelihood for those participating in monitoring of the usage of stoves and maintenance of stoves.

Technological well being

- Introduces newer energy efficient cooking technology with efficiency of greater than 20% compared to baseline technology with efficiency 10%[5] which reduces indoor pollution through efficient combustion and hence reduces fuel wood consumption.
- Introduces technology and materials that enables handling of the device after cooking due to lower surface temperature.
- Introduces a new and revolutionary, first of its kind design of cookstove that both cooks and produces electricity, allowing for users to light their homes and charge mobile phones while they cook.

Thus, the CPA will contribute to the sustainable development of the region and host country.

A.2. Location of CPA

[5] In instances where it is recorded that a three stone fire is not the baseline stove, or where it is recorded that the baseline stove has a grate or a chimney, 20%.

The location of Kenya is between latitudes 5°N and 5°S, and longitudes 34° and 42°E[6]. Nairobi is the national capital of Kenya and is located at 01.17°S and 36.48°E[7]. The entire host country is under the scope of the CPA.

A.3. Technologies/measures

The HomeStove is an ultra-clean burning fan-assisted wood stove that cuts toxic pollutant emissions by 90% for a cleaner planet and a healthier household, and reduces fuel use by 50%. In addition, utilizing BioLite's patented Direct Conduction Thermoelectric System (DCTS), the HomeStove also generates its own electricity, providing users with enough reliable, on-demand electricity in a day's cooking to fully charge a mobile phone and provide an evening's worth of bright, LED light. The HomeStove's ease of use, gas-like flame, feature set and reliability in the field are borne out by customer satisfaction rates: over 93% of users would recommend the HomeStove to a friend or family member.

The HomeStove is designed and engineered in the US and is manufactured in China.

The table below presents an overview of the physical and design specifications of the HomeStove, as determined by tests carried out at BioLite's manufacturing and testing facilities and / or BioLite partners:

HomeStove Manufacturer Specifications	
Shipping Weight	6.7 kg
Dimensions	25 x 31 cm
USB Power Output	2 Watts at 5 Volts
FlexLight Lumens	100 Lumens
Materials	Stainless Steel, Cast Iron
Cooking Power Range	0.5 kW - 2kW
Projected Lifespan	5 years
Supported Fuels	Biomass (Wood, Dung, Crop Waste)

[6] https://en.wikipedia.org/wiki/Kenya

[7] http://www.mapsofworld.com/lat_long/kenya-lat-long.html

Thermal efficiency	45.3%[8]

New models of stoves with similar design principles may be added in the future.

The baseline scenario is a continuation of current practice, thus identical to the scenario existing prior to the implementation of the CPA. There are no facilities, systems or equipment in operation in the baseline scenario other than inefficient biomass cooking methods and devices.

A.4. Coordinating/managing entity

The coordinating / managing entity of the SSC-PoA is BioLite India Private Limited, which is among the entities that communicates with the Executive Board of UNFCCC. International Carbon Portfolio Ltd. (ICPL) will implement and operate the CPA in collaboration with local partners and assume all costs related to the CPA.

A.5. Parties and CPA implementers

Parties involved	CPA implementers	Indicate if the Party involved wishes to be considered as CPA implementer (Yes/No)
Switzerland	International Carbon Portfolio Ltd.	No

A.6. Public funding of CPA

There is no public funding for the CPA.

A.7. History of CPA

The CME has monitored the database (UNFCCC and other GHG ER standards) to check that the project does not generate offsets more than once simultaneously and confirmed that the proposed CPA is neither registered as an individual CDM project activity or is part of another registered PoA. The CME can confirm that the CPA has not been excluded from a registered CDM PoA as a result of erroneous inclusion of CPAs. Finally, this CPA will not lead to the discontinuation or modification of any former projects[9] in the same geographical boundary, and does not decrease the GHG emission reductions or net anthropogenic GHG removals any former projects.

A.8. Debundling

If each of the independent subsystems/measures (e.g., biogas digester, solar home system) 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 is exempted from performing de-bundling check i.e., considered as not being a de-bundled component of a large scale activity.

The threshold to prove the activity is not a debundled action is derived from the small scale threshold for each SSC-CPA, which corresponds to 180GWh[10] thermal energy per year as follows:
1% of 180GWh = 1.8GWh

[8] BIOLITE HOME STOVE TEST REPORT, KENYA INDUSTRIAL RESEARCH AND DEVELOPMENT INSTITUTE (KIRDI), Nairobi, Kenya, 11th MARCH 2016.

[9] As defined in the Project Standard ver 2.0, para 167

[10] As clarified in SSC_223, The SSC WG agreed to clarify that AMS-II.G is applicable to project activities with maximum thermal energy savings of 180 GWh per year.

Therefore, a debundling check will occur for any CPA that includes a technology type with a proven thermal energy savings of more than 1.8GWh/y/appliance.

Energy saving from the BioLite HomeStove (independent sub system/measures) as described below:

Parameter	Value	Unit	Source
$B_{y,savings}$	3.59	(t/appliance/yr)	As calculated below
NCV biomass	0.015[11]	TJ/Tonne	Default value given by AMS.II.G
Energy savings	53.84	GJ/appliance/yr	Calculated as below
Energy savings	0.0150	GWh/appliance/yr	Calculated as below

The value of By savings is calculated as per the equation given in the methodology para 6, option 2

$$B_{y,savings} = B_{old} \cdot (1 - \frac{\eta_{old}}{\eta_{new}})$$

B_{old} – 4.85 tonnes/year
η_{old} – 10% (Default value given in the methodology AMS II.G Version 03)
η_{new} – 45.3% (Test was conducted by Kenya Industrial Research and Development Institute (KIRDI)[12])

$B_{y,savings}$ (before leakage) = 4.85*(1-(0.10/0.453))
= 3.78 tonnes/year

$B_{y,savings}$ (after leakage) = 3.59 tonnes/year
The energy savings is calculated by

$B_{y,savings} * NCV_{biomass}$

Energy savings/appliance (after leakage) = 3.59 * 15
= 53.84 GJ/appliance/year

Converting GJ to GWh, the energy savings per appliance is 0.0150 GWh/year.
The proposed small scale CPA involves the technology which has the thermal energy savings of 0.0150 GWh/y which is less than 1.8 GWh/y. Hence the proposed CPA is not a debundled component of large- scale activity.

SECTION B. Application of methodologies and standardized baselines

B.1. References to methodologies and standardized baselines

[11] Default value given in AMS II.G

[12] KENYA INDUSTRIAL RESEARCH AND DEVELOPMENT INSTITUTE (KIRDI), NAIROBI, KENYA, BIOLITE HOME STOVE TEST REPORT – 11TH MARCH 2016. KIRDI is an approved Regional Testing Center for the Global Alliance for Clean Cookstoves

Energy efficiency measures in thermal applications of non-renewable biomass, AMS-II.G ver 3[13]
ASB0035: Baseline woody biomass consumption for household cookstoves in Kenya (version 01.0)[14]

B.2. Project boundary, sources and greenhouse gases (GHGs)

	Source	Gas	Included?	Justification/Explanation
Baseline	Combustion of fuel wood for cooking	CO_2	**Yes**	Major source of emissions from combustion of fuel
		CH_4	**No**	Minor source of emissions and limited data available. Exclusion is conservative assumption.
		N_2O	**No**	Minor source of emissions and limited data available. Exclusion is conservative assumption.
Project activity	Combustion of fuel wood for cooking (efficient stove)	CO_2	**Yes**	Major source of emissions from combustion of fuel
		CH_4	**No**	Minor source of emissions and limited data available. Excluded for simplicity
		N2O	**No**	Minor source of emissions and limited data available. Excluded for simplicity

B.3. Establishment and description of baseline scenario

The target group in the proposed CPA are urban and rural households currently using inefficient biomass based traditional cook stoves in biomass deficient regions nationwide. This includes households who currently cook with a three-stone fire or other traditional and inefficient technology that is fuelled with wood. It also includes households that currently cook with inefficient charcoal stoves. In fact, nearly all parts of Kenya can be considered biomass deficient due to significant biomass harvesting for cooking and for other purposes. For example, UNESCO[15] reported in 2006 how "Since independence in 1963, Kenya's forest cover has shrunk from 10% of its 582,650 km^2 territory to a mere 1.7%". Likewise, FAO data show a decline in forest areas and growing stock in forest land. In the last 20 years, the forested area in Kenya reduced by 0.35% per year between 1990 and 2000, by 0.34% per year between 2000 and 2005 and by 0.31% per year between 2005 and 2010[16].

B.4. Estimation of emission reductions

B.4.1. Explanation of methodological choices

[13] http://cdm.unfccc.int/methodologies/DB/DCO8WRRQVTGLH1GHQBCL035F5M13R8

[14] https://cdm.unfccc.int/methodologies/standard_base/2015/sb103.html

[15] UNESCO (2006). Fighting desertification in Kenya, one tree at a time. Courier, 3, p.7, http://unesdoc.unesco.org/images/0019/001915/191578e.pdf#193846

[16] Source: FAO (2010): Global Forest Resources Assessment 2010, Country Report Kenya, p.9 and p.25, http://www.fao.org/docrep/013/al543E/al543E.pdf

This project activity is applicable as per definition in the Annex B of simplified methodologies for small scale CDM project activity categories, Type II.G. Energy Efficiency measures in thermal application of non-renewable biomass; Version 03; EB 60.

As per para 6 of AMS II G version 03, $B_{y\ savings}$ is estimated using option 2. In cases where charcoal is included in the baseline and/or project scenario, a locally appropriate conversion factor for converting from wood to charcoal is chosen in order to calculate the amount of woody biomass included in B_{old}.

As per para 13 of AMS II G, version 03, Leakage related to the non-renewable woody biomass saved by the project activity shall be assessed based on *ex post* surveys of users and the areas from which this woody biomass is sourced. Alternatively 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.

Determining f_{NRB} :
According to the methodology, the share of renewable and non-renewable woody biomass in B_{old} (the quantity of woody biomass used in the absence of the project activity) is determined using nationally approved methods (e.g., surveys or government data if available) and determine $f_{NRB,y}$. UNFCCC default values[17] for f_{NRB} can also be applied. In cases of calculating f_{NRB}, the following principles need to be taken into account:

Demonstrably renewable woody biomass (DRB):
As per para 9 of AMS II.G ,version 03, Woody biomass is "renewable" if any one of the following two conditions is satisfied:
I. The woody biomass is originating from land areas that are forests where:
(a) The land area remains a forest; and
(b) Sustainable management practices are undertaken on these land areas to ensure, in particular, that the level of carbon stocks on these land areas does not systematically decrease over time (carbon stocks may temporarily decrease due to harvesting); and
(c) Any national or regional forestry and nature conservation regulations are complied with.
II. The biomass is woody biomass and originates from non-forest areas (e.g., croplands, grasslands) where:
(a) The land area remains as non-forest or is reverted to forest; and
(b) Sustainable management practices are undertaken on these land areas to ensure in particular that the level of carbon stocks on these land areas does not systematically decrease over time (carbon stocks may temporarily decrease due to harvesting); and
(c) Any national or regional forestry, agriculture and nature conservation regulations are complied with.

Non-renewable biomass:
As per para 10 of AMS II.G, version 03,Non-renewable woody biomass (NRB) is the quantity of woody biomass used in the absence of the project activity (B_y) minus the DRB component, so long as at least two of the following supporting indicators are shown to exist:

- Trend showing increase in time spent or distance travelled by users (or fuel-wood suppliers) for gathering fuel wood or alternatively trend showing increase in transportation distances for the
- fuel wood transported into the project area;
- Survey results, national or local statistics, studies, maps or other sources of information such as remote sensing data that show that carbon stocks are depleting in the project area;
- Increasing trends in fuel wood price indicating scarcity;

Trends in the type of cooking fuel collected by users, suggesting scarcity of woody biomass.

B.4.2. Data and parameters fixed ex ante

Data / Parameter	η_{old}

[17] https://cdm.unfccc.int/DNA/fNRB/index.html

Data unit	Fraction
Description	*Efficiency of the baseline cook stove*
Source of data	Default value given in AMS II.G version 03
Value(s) applied	0.10 or 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 as well as a chimney. The replaced systems in the project area are lacking improved combustion air supply mechanism and flue gas ventilation system. In instances where a three stone fire is not the primary baseline stove, or where the baseline stove has a grate or a chimney, 0.20 will be used. In such instances, a weighted average will be calculated between units for which 0.10 is applied vs units for which 0.20 is applied.
Purpose of data	Calculation of baseline emissions
Additional comment	-

Data / Parameter	**$NCV_{biomass}$**
Data unit	TJ/tonne
Description	Net Calorific value of non renewable woody biomass that is consumed in the baseline and project scenarios.
Source of data	Default value given in AMS II.G version 03
Value(s) applied	0.015
Choice of data or measurement methods and procedures	The default net calorific value of woody biomass as given in the methodology
Purpose of data	Calculation of baseline emissions
Additional comment	-

Data / Parameter	$EF_{projected\_fossilfuel}$
Data unit	tCO_2/TJ
Description	Emission factor for substitution of non- renewable woody biomass by similar consumers
Source of data	Default value given in AMS-II.G Version 03
Value(s) applied	81.6
Choice of data or measurement methods and procedures	This is a default value as given in the methodology AMS II.G version 03
Purpose of data	Calculation of baseline emissions
Additional comment	-

Data / Parameter	L_y
Data unit	Percentage
Description	Leakage Correction factor
Source of data	Default value given in AMS-II.G Version 03
Value(s) applied	0.95
Choice of data or measurement methods and procedures	Default value as per the para 13 a of methodology AMS-II.G/version 03
Purpose of data	Calculation of baseline emissions
Additional comment	-

Data / Parameter	B_{old}
Data unit	Tonnes/year
Description	Quantity of woody biomass used in the absence of the project activity in tonnes

Source of data	Calculated using standardized baseline ASB0035[18]
Value(s) applied	0.76 t/person/y or 5.17[19] t/hh/y rural, or 0.83 t/person/y or 3.98[20] t/hh/y urban 58,180[21] (for ex-ante calculations only)
Choice of data or measurement methods and procedures	B_{old} is determined by multiplying the number of operational stoves (N_y) and quantity of annual average consumption of woody biomass per appliance (determined by calculating the weighted average mix between urban and rural ICS population). N_y is assessed through household visits of the randomly selected sample of household annually to check the operational rate of ICS deployed.
Purpose of data	Calculation of baseline emissions
Additional comment	For each ICS distributed, the urban / rural category will be recorded at the time of sale based on the address of the ICS beneficiary, and fixed for the entire crediting period for the corresponding ICS. If for any ICS the Urban / Rural category information is not recorded/available, a B_{old} value of 3.98 tonnes/hh/year shall be applied for that ICS, as a conservative measure.

Data / Parameter	$f_{NRB,y}$
Data unit	Fraction
Description	Fraction of woody biomass saved by the project activity in period y that can be established as non-renewable biomass
Source of data	Non-Renewable Biomass Study for PoA 7997 in Kenya BioLite, November, 2019 (based on publicly available data)
Value(s) applied	0.9272
Choice of data or measurement methods and procedures	Locally appropriate value to be calculated as per section B.4.1.
Purpose of data	Calculation of baseline emissions
Additional comment	

B.4.3. Ex ante calculation of emission reductions

Ex-ante emission reduction has been calculated as per the approved methodology

As per paragraph 5 of AMS II.G version 03, Emission reductions would be calculated as

[18] See excel ER calculation sheet for details of calculations for B_{old}

[19] See excel ER calculation sheet for household size calculations resulting in this value

[20] See excel ER calculation sheet for household size calculations resulting in this value

[21] Assuming number of operational stoves (N_y) as 12,000 and annual average consumption of woody biomass per appliance as 4.85 tonnes/hh/year (= 5.17 * % rural population in Uganda + 3.98 * % urban population in Kenya, sourced from Cira, Dean A.; Kamunyori, Sheila W.; Babijes, Roderick M.. 2016. Kenya urbanization review. Washington, DC: World Bank, pg 3). Refer ER calculator for details.

$$ER_y = B_{y,savings} * f_{NRB,y} * NCV_{biomass} * EF_{projected\_fossilfuel}$$

Where:

ER_y	Emission reductions during the year y in tCO_2e
$B_{y,savings}$	Quantity of woody biomass that is saved in tonnes
$f_{NRB,y}$	Fraction of woody biomass saved by the project activity in year y that can be established as non-renewable biomass
$NCV_{biomass}$	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[3]

ER_y = 3.59*0.9272*0.015*81.6

= 4.07 $tCO_2e/y/appliance$

And

As per para 6 of AMS II G version 03, $B_{y\ savings}$ is estimated using option 2

$$B_{y,savings} = B_{old} \cdot (1 - \frac{\eta_{old}}{\eta_{new}})$$

Where:

B_{old}	Quantity of woody biomass used in the absence of the project activity in tonnes
η_{old}	1. 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; 2. A default value of 0.10 may be optionally used if the replaced system is a three stone fire, or a conventional system with no improved combustion air supply or flue gas ventilation system, i.e. without a grate or a chimney; for other types of systems a default value of 0.2 may be optionally used
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 if more than one type of system is being introduced by the project activity

$B_{ysavings}$ Leakage = 4.61 (1-(0.10/0.453))

= 3.59 t/household/yr

As per para 13 of AMS II G, version 03,
Leakage related to the non-renewable woody biomass saved by the project activity shall be assessed based on *ex post* surveys of users and the areas from which this woody biomass is sourced (using 90/30 precision for a selection of samples).

B_{old} is multiplied by a net to gross adjustment factor of 0.95 to account for leakages, in which case surveys are not required.

$B_{old}Leakage = 4.85 * 0.95$
$= 4.61$ t/year

Determining f_{NRB}:

The value for fNRB has been calculated manually using publicly available third party data. This is detailed in an accompanying report and the excel calculator.[22]

B.4.4. Summary of ex ante estimates of emission reductions

Year	Baseline emissions (t CO_2e)	Project emissions (t CO_2e)	Leakage (t CO_2e)	Emission reductions (t CO_2e)
Year 1	48,877	0	0	48,877
Year 2	48,877	0	0	48,877
Year 3	48,877	0	0	48,877
Year 4	48,877	0	0	48,877
Year 5	48,877	0	0	48,877
Year 6	48,877	0	0	48,877
Year 7	48,877	0	0	48,877
Total	**342,141**	**0**	**0**	**342,141**
Total number of crediting years				**7**
Annual average over the crediting period	**48,877**	**0**	**0**	**48,877**

B.5. Monitoring plan

B.5.1. Data and parameters to be monitored

The data and parameters to be monitored are:

Data / Parameter	$N_{y,}$
Data unit	Number
Description	Number of cook stoves in operation or replaced
Source of data	Survey conducted on sample of households and visually assess if the stove is in operation
Value(s) applied	12,000
Measurement methods and procedures	The parameter will be assessed through household visits of the randomly selected sample of household annually. The households selected will be visited by staff/third party appointed by the CPA Implementer. During each visit, the existence and functionality of the appliance is confirmed through a visual assessment of the appliance with the unique ID clearly visible.
Monitoring frequency	Annually
QA/QC procedures	No. of days the improved stove is in operation
Purpose of data	Calculation of baseline emissions
Additional comment	Will be adjusted up or down in order to match the SSC threshold

[22] Non-Renewable Biomass Study for PoA 7997 in Kenya BioLite, November, 2019

Data / Parameter	η_{new}
Data unit	Fraction
Description	Efficiency of the system being deployed as part of the project activity
Source of data	Water boiling test conducted in a laboratory setting by the CPA implementer or a third party
Value(s) applied	0.453
Measurement methods and procedures	The parameter will be assessed through performing WBTs to test the thermal efficiency on a randomly selected sample of appliances either annually or biennially, as specified in the PoA-DD. The WBT test will follow the guidelines of the Water Boiling Test Version 4.2.3. developed by Global Alliance for Clean Cookstoves partners[23]. All measurement methods, equipments and equipment calibration methods will adhere to the protocol. The CPA implementer will ensure all WBTs performed during the sampling are conducted by well trained staff, with prior experience conducting WBTs and recording the results. The equipment used for WBT • Scale with a capacity of at least 6 kg an accuracy of ±1 gram • Digital thermometer • Wood moisture meter • Timer • Standard pots • Wood fixture for holding thermocouple probe in water
Monitoring frequency	Annually or biennially. When biennial inspection is chosen 95/5 level of prevision will be achieved, whereas with annually, a 90/10 level of precision will be achieved.
QA/QC procedures	Calibrated equipment will be used for monitoring.
Purpose of data	Calculation of baseline emissions
Additional comment	The ex-ante test (for purposes of ER projections) was conducted by KENYA INDUSTRIAL RESEARCH AND DEVELOPMENT INSTITUTE (KIRDI)[24]

Data / Parameter	Continuous use of baseline stoves
Data unit	Numbers
Description	Number of households continuously using baseline stoves
Source of data	Survey conducted on sample of households
Value(s) applied	0
Measurement methods and procedures	The annual sampling and survey will be conducted to determine that if the households are still continuing with the inefficient baseline stoves along with the improved cook stove then the fuel wood consumption in baseline stoves will be excluded from B_{old} and accordingly emission reduction will be calculated.
Monitoring frequency	Annually
QA/QC procedures	The data will be collected at the end of each verification period and will be used for the calculation of emission reductions
Purpose of data	Calculation of baseline emissions
Additional comment	It is assumed that baseline cook stoves will not be used after the implementation of improved cook stoves. However it will monitored based on annual survey conducted.

Data / Parameter	$B_{y\ savings}$
Data unit	Tonnes/year
Description	Quantity of woody biomass that is saved in tonnes
Source of data	Calculated
Value(s) applied	45,337
Measurement methods and procedures	$B_{y\ savings}$ is calculated using option 2 under paragraph 6 of AMS II.G version 03

[23] http://cleancookstoves.org/technology-and-fuels/testing/protocols.html

[24] BIOLITE HOME STOVE TEST REPORT, KENYA INDUSTRIAL RESEARCH AND DEVELOPMENT INSTITUTE (KIRDI), Nairobi, Kenya, 11th MARCH 2016.

	$B_{y,savings} = B_{old} \cdot (1-\frac{\eta_{old}}{\eta_{new}})$ Using the equation $B_{y,savings}$ = 45,337 t/yr The fuel wood consumption in the baseline, efficiency of stove used in the baseline and efficiency of improved cook stoves are considered to determine the By savings. **$B_{y,savings}$ = 58,180*(1-(0.10/0.453))** **= 45,337 t/year**
Monitoring frequency	Per the underlying variables
QA/QC procedures	The data will be collected at the end of each verification period and will be used for the calculation of emission reductions
Purpose of data	Calculation of baseline emissions
Additional comment	-

B.5.2. Sampling plan

Sampling:
As per paragraph 22 of AMS-II.G Version 03, all representative sampling performed during monitoring will satisfy the requirements of the methodology to be a statistically valid sample. For biennial monitoring, parameters determined through representative sampling will satisfy the 95 per cent confidence interval and 5 per cent margin of error requirement. For annual sampling the requirements are 90 per cent confidence interval and 10 per cent margin of error. In cases where the 95 or 90 per cent confidence interval and the 5 or 10 per cent margin of error are not achieved, the lower bound of the 95 or 90 per cent confidence interval will be chosen if the representative sampling is not repeated.

Parameters determined through a representative sample will perform sampling as specified by the *"Sampling and surveys for CDM project activities and programmes of activities", version 04* . The sampling plan for N_y, $\eta_{new,,}$ B_{old} will be performed for each CPA and is the following:

Objective:
To determine the average number of appliances in use, average wood use on the baseline & project technology, average wood use by project & non project households and average efficiency of the appliance will be assessed using a 90/10 confidence/precision if assessed annually or 95/5 confidence/precision if assessed biennially basis during the verification.

Field Measurement and Data to be collected:

a) Monitoring of appliances in operation on a sample basis and visually assess if the appliance is presently operational and/or replaced (Monitoring will be done annually and paragraph 22 of AMS II.G will be followed for sampling).
b) As per requirement of AMS II.G, version 03, perform a Water Boiling Test on the appliance to test thermal efficiency ($\eta_{new)}$. The data collected is the thermal efficiency of the stove (Monitoring will be done annually and paragraph 22 of AMS II.G will be followed for sampling).
c) Quantity of woody biomass used in the absence of the project activity is determined by multiplying the number of appliances in operation with quantity of annual average woody biomass consumption per appliance.
d) Monitoring of fraction of woody biomass saved by the project activity in year y on annual basis that can be established as non-renewable biomass.
e) Monitoring of continuous use of baseline stoves will be done annually by conducting survey of local usage.

Target Population:
The target population is the complete list of appliances distributed and recorded during project construction. The sample of appliances checked will be randomly selected from the complete list of

distributed appliances. The rural appliances and urban appliances will be differentiated in the database based on data having been recorded when the stove was sold, which will enable the population to easily be broken into subgroups. Similarly, the vintage stove will be known based on the date of sale.

Sample Method:
In order for the population to be considered homogenous, the following criteria must be met:
i) appliances must have comparable input/output characteristics, including the same level of efficiency, and provide comparable levels of service (i.e. cooking) ii) customers must be either all considered rural or all considered urban and iii) appliances must be appliances of the same age (i.e. all year 1 stoves, all year 2 stoves, etc).

While this CPA satisfies point i above, it is expected that the CPA will not satisfy points ii and iii above. Therefore, a sampling approach applicable to heterogenous populations will be employed. As such, stratified random sampling will be used in order to target sufficient numbers of each subgroup to be representative of the entire population.

Sample Size:
The type of parameters of interest are mean values and proportion value (para 11, annex 2, EB 65)

The determination of sample size will be done either manually or using appropriate statistical software as described in EB 69, Annex 4.

As per *"Guidelines for sampling & surveys for CDM project activities and programme of activities", version 02.0, annex 5, EB 69,* for sample size calculation for small scale projects 90% confidence and margin of error of 10% is required.

The illustration of sample size calculation using the formula given in above guidelines is shown below:

Illustration for 90/10 level:
For proportion values:

$$n > \frac{(1.645)^2 \times N \times p\,(1-p)}{(N-1) \times 0.1^2 \times p^2 + 1.645^2 \times p(1-p)}$$

Where:

n	Sample size
N	Total number of households
p	Our expected proportion (0.50)
1.645	Represents the 90% confidence required
0.1	Represents the 10% relative precision (0.1x0.5 = 0.05 = 5% points either side of p)

This gives sample size = 137[25] for 12,000 number of cook stoves with 90/10 confidence level. Assuming that 10% of the beneficiaries' do not respond.

For mean values:

$$n \geq \frac{1.645^2 NV}{(N-1) \times 0.1^2 + 1.645^2 V}$$

Where:

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

[25] UNFCCC Sample Size Calculator Version 3.1

n = Sample size
N = Total number of households
Mean = Our expected mean (X)
SD = Our expected standard deviation
1.645 = Represents the 90% confidence required
0.1 = Represents the 10% relative precision (0.1x0.5 = 0.05 = 5% points either side of p)

Cross CPA Sampling[26]

Cross CPA sampling is allowed among similar CPAs, as long as sampling is conducted sufficient to get precision level of 95/10. A stratified analysis will be conducted because in this case, homogeneity between CPAs cannot be assumed, making a stratified analysis particularly suitable[27]. In order to calculate the sample size for variables to be sampled across CPAs, the following equations will be applied:

For proportion values:

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

Where:

$$V = \frac{SD^2}{\overline{p}^2} = \frac{Weighted\ overall\ expected\ variance}{Weighted\ overall\ expected\ proportion,\ squared}$$ Equation (2)

$$SD^2 = \frac{(g_a \times p_a(1-p_a)) + (g_b \times p_b(1-p_b)) + (g_c \times p_c(1-p_c)) + \ldots + (g_k \times p_k(1-p_k))}{N}$$ Equation (3)

$$\overline{p} = \frac{(g_a \times p_a) + (g_b \times p_b) + (g_c \times p_c) + \ldots + (g_k \times p_k)}{N}$$ Equation (4)

Where:

g_i = Size of the i^{th} group (CPA) where i=a,…,k
p_i = Proportion of the i^{th} group (CPA) where i=a,…,k
N = Population total

We can then plug the sample size calculated using the above equations into the equation below in order to calculate the sample size for each CPA:

$$n_i = \frac{g_i}{N} \times n$$ Equation (9)

Where:

n_i = The sample size required for the i^{th} group (CPA) where i=a,…,k
g_i = Size of the i^{th} group (CPA) where i=a,…,k
N = Population total
n = The total sample size required

For mean values

[26] "Sampling and surveys for CDM project activities and programmes of activities," Ver 4, Appendix 3: Best-practice examples for a single sampling plan for a heterogeneous PoA using a stratified sampling approach

[27] Sampling and surveys for CDM project activities and programmes of activities," Ver 4, section 2.1.9.

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

Where:

$$V = \frac{SD^2}{\bar{m}^2} = \frac{\text{weighted overall expected variance}}{\text{weighted overall expected mean, squared}}$$

$$\bar{m} = \frac{(g_a \times m_a) + (g_b \times m_b) + (g_c \times m_c) + \ldots + (g_k \times m_k)}{N}$$

$$SD^2 = \frac{(g_a \times SD_a^2) + (g_b \times SD_b^2) + (g_c \times SD_c^2) + \ldots + (g_k \times SD_k^2)}{N}$$

Where:

g_i	Size of the i^{th} group (CPA) where i=a,…,k
m_i	Mean of the i^{th} group (CPA) where i=a,…,k
SD_i	Standard deviation of the i^{th} group (CPA) where i=a,…,k, (note that these are all squared – so the group size is actually being multiplied by the group variance)
N	Population total

We can then plug the sample size calculated using the above equations into the equation below in order to calculate the sample size for each CPA:

$$n_i = \frac{g_i}{N} \times n$$

Where:

n_i	=	The sample size required for the i^{th} group (CPA) where i=a,…,k
g_i	=	Size of the i^{th} group (CPA) where i=a,…,k
N	=	Population total
n	=	The total sample size required

Once the sample size has been calculated for each CPA, each of the sample sizes will be added together (n_{iCPA1}, n_{iCPA2}, etc) to get a total sample size needed for all CPAs, rounding up in each case. Where needed, adjustments will be made to sample sizes to account for the non-response rate by dividing the originally calculated sample size by the expected non-response rate.

The approach will take into account any needed differences between proportional variables and numeric (mean variables). In instances where a single survey is being implemented to gather data for multiple variables, the survey will be conducted among the largest sample size calculated for each of the variables in order to insure that the appropriate level of precision has been reached or exceeded for all variables.

Assessing of parameters:

The parameter η_{new} will be assessed through performing WBT on a randomly selected sample of appliances annually. The WBT test will follow the guidelines of the latest version of the Water Boiling Test protocol (currently at version 4.2.3[28]). All measurement methods, equipments and equipment calibration methods will adhere to the protocol. The CPA implementer will ensure all WBTs performed during the sampling are conducted by well trained staff, with prior experience conducting WBTs and recording the results. The CME will verify that all the staff/third party appointed by the CPA implementer are sufficiently trained. The WBTs will be performed in the field and results will be

[28] http://cleancookstoves.org/technology-and-fuels/testing/protocols.html

recorded. The data will be submitted to CME and test results will be made available to DOE during verification.

The parameter B_{old} is calculated as the product of the number of systems multiplied by the estimated average annual consumption of woody biomass per appliance (tonnes/year). This can be derived from historical data or a survey of local usage annually (as per para 7a of AMS II.G).

The annual sampling and survey will be conducted to determine that if the target beneficiaries are still continuing with the inefficient baseline stoves along with the improved cook stove then the fuel wood consumption in baseline stoves will be excluded from B_{old} and accordingly emission reduction will be calculated.

The parameter N_y will be assessed through household visits of the randomly selected sample of household annually. The households selected will be visited by the CPA Implementer. During each visit, the existence and functionality of the appliance is confirmed through a visual assessment of the appliance with the unique ID clearly visible. During the household visit, a household representative is asked if he/she is willing to participate in the sampling of additional parameters. Otherwise, a new household is randomly selected for sampling. Scale up can be used for sampling as explained above.
As per Option 2 under para 6 the parameter $B_{y\ savings}$ is determined by

1. $$B_{y,savings} = B_{old} \cdot (1 - \frac{\eta_{old}}{\eta_{new}}) \quad \textbf{(1)}$$

Where:

B_{old}	*Quantity of woody biomass used in the absence of the project activity in tonnes*
η_{old}	*Option 2 is used where, a default value of 0.10 is used since the replaced system is a three stone fire, or a conventional system with no improved combustion air supply or flue gas ventilation system, i.e. without a grate or a chimney; in instances where a three stone fire is not the primary baseline stove, or where the baseline stove has a grate or a chimney, 0.20 will be used.*
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 if more than one type of system is being introduced by the project activity*

B.5.3. Other elements of monitoring plan

The CME will operate a monitoring plan during each verification period. The monitoring includes the following parameters

1. $\eta_{new,}$ Efficiency of system being deployed as part of the project activity
2. N_{yi} No of stoves in operation
3. Continuous use of baseline stoves
4. $B_{y\ savings}$ Quantity of woody biomass that is saved in tonnes

As per the requirements of standardized baseline ASB0035, fuel use at the time of distribution of the project stove will be noted, and if any LPG or kerosene are found in the pre-project scenario, the standardized baseline will not be applied to those specific households.

Furthermore, whether each customer is classified as “rural” or “urban” based on where they live will be recorded at the time of distribution of the project stove. A credible, third party classification system of rural and urban in Kenya will be applied in order to determine this. Placeholder values have been included for the split between urban and rural using World Bank data indicating that 73% of the

population is rural and 27% of the population is urban. These are national averages and will be replaced with actual values at verification.

As per paragraph 15 of AMS-II.G version 03 Monitoring shall consist of checking the efficiency of all appliances or a representative sample thereof, at least once every two years (biennial) to ensure that they are still operating at the specified efficiency (η_{new}) or replaced by an equivalent in service appliance. Where replacements are made, monitoring shall also ensure that the efficiency of the new appliances is similar to the appliances being replaced. Survey is conducted on selected sample of appliances annually.

As per paragraph 7 of AMS II.G Version 03 B_{old} is determined by multiplying the number of operational stoves (N_y) and quantity of annual average consumption of woody biomass per appliance. N_y is assessed through household visits of the randomly selected sample of household at least once every two years (biennial).

As per paragraph 16 of AMS-II.G Version 03, Monitoring shall also consist of checking of all appliances or a representative sample thereof, at least once every two years (biennial) to determine if they are still operating or are replaced by an equivalent in service appliance (N_y). Survey is conducted on selected sample of appliances annually.

$B_{y\ savings}$ is calculated using option 2 under paragraph 6 of AMS II.G version 03 as explained below.

As per paragraph 17 of AMS II.G Version 03, If the quantity of fuel saved is determined using the Kitchen Performance Test (i.e. paragraph 6, Option 1), monitoring shall ensure that fuel consumption during the period of the project activity is monitored annually.

Paragraph 17 is not applicable as Option 2 under paragraph 6 is used to calculate $B_{y\ savings}$.

As per paragraph 18 of AMS II.G Version 03, If option (b) in paragraph 7 is chosen for determining B_{old}, monitoring shall include the amount of thermal energy generated by the project technology *t* in year y.

Paragraph 18 is not applicable as option (a) under para 7 is chosen for determining $B_{old.}$

As per paragraph 20 of AMS-II.G Version 03 Monitoring shall ensure that:

a. Either the replaced low efficiency appliances are disposed of and not used within the boundary or within the region; or
b. If baseline stoves continue to be used, monitoring shall ensure that the fuel-wood consumption of those stoves is excluded from B_{old}.

For para 20 based on sampling new or old technology is used, we will identify correction factor for calculating emission reduction.

As per paragraph 21 of AMS II.G version 03, If option (b) in paragraph 7 is chosen for determining B_{old} *monitoring* shall include the amount of thermal energy generated by the project technology in year y.

Paragraph 21 is not applicable as option (a) under para 7 is chosen for determining $B_{old.}$

Demonstrably renewable woody biomass (DRB):
Calculation of DRB is done by option I of para 9 of AMS II.G

9. Woody[29] biomass is “renewable” if following conditions is satisfied:

[29] In cases of charcoal produced from woody biomass, the demonstration of renewability shall be done for the areas where the woody biomass is sourced.

I. The woody biomass is originating from land areas that are forests[30] where:

(a) The land area remains a forest; and

(b) Sustainable management practices are undertaken on these land areas to ensure, in particular, that the level of carbon stocks on these land areas does not systematically decrease over time (carbon stocks may temporarily decrease due to harvesting); and

(c) Any national or regional forestry and nature conservation regulations are complied with.

This will be conservatively considered based on available national or regional data from survey results, national or local statistics, studies, maps and other source of information.

Non-renewable biomass (NRB):
NRB will be determined as per para 10 of AMS II.G
Non-renewable woody biomass (*NRB*) is the quantity of woody biomass used in the absence of the project activity (B_{old}) minus the *DRB* component, as long as at least two of the following supporting indicators are shown to exist:

- A trend showing an increase in time spent or distance travelled for gathering fuelwood, by users (or fuel-wood suppliers) or alternatively, a trend showing an increase in the distance the fuel-wood is transported to the project area;
- Survey results, national or local statistics, studies, maps or other sources of information, such as remote-sensing data, that show that carbon stocks are depleting in the project area;
- Increasing trends in fuel wood prices indicating a scarcity of fuel-wood;
- Trends in the types of cooking fuel collected by users that indicate a scarcity of woody biomass.

The detailed computation is done in the report on fNRB accompanying this CPA-DD.

Implementation:
Staff/third party agency appointed by the CPA Implementer conducts the sampling and determines the various monitoring parameters in individual CPAs.

Monitoring report
A monitoring report will be prepared at the end of every verification period and submitted to the Designated Operational Entity (DOE) responsible for verification. This report will indicate how the monitoring plan has been followed and calculate the emissions reductions for each verification period.

SECTION C. Start date, crediting period type and duration

C.1. Start date of CPA

15/12/2019 – expected start date of CPA based on the expected date of first distribution of stoves

C.2. Expected operational lifetime of CPA

7 years 00 months

C.3. Crediting period of CPA

C.3.1. Type of crediting period

Renewable crediting period

[30] The forest definitions as established by the country in accordance with the decisions 11/CP.7 and 19/CP.9 should apply.

C.3.2. Start date of crediting period

15/12/2019

C.3.3. Duration of crediting period

7 years 00 months

SECTION D. Environmental impacts

D.1. Analysis of environmental impacts

The project activity does not require an Environmental Impact Assessment (EIA) according to Kenya law[31]. Hence, Environmental Impact Analysis is not done for this proposed CPA.

D.2. Environmental impact assessment

See section D.1.

SECTION E. Local stakeholder consultation

E.1. Modalities for local stakeholder consultation

N/A – stakeholder consultation in Kenya already conducted at the PoA level.

E.2. Summary of comments received

N/A – stakeholder consultation in Kenya already conducted at the PoA level.

E.3. Consideration of comments received

N/A – stakeholder consultation in Kenya already conducted at the PoA level.

SECTION F. Eligibility for inclusion

This CPA will meet the following eligibility criteria mentioned in section C of the PoA:

No.	Eligibility criterion - Category	Eligibility criterion - Required condition	Supporting evidence for inclusion	Description of this CPA in relation to the criterion and supporting evidence
1.	Geographical boundaries	Each CPA will be located within the geographical boundary of India, Kenya or Uganda.	CPA-DD section A.2.	The proposed CPA is located in Kenya.
2.	Avoiding double counting	For each CPA, CME will check for double counting. Tracking of cook stoves will be done based on unique identification such as:	Evidence of appropriate systems in place.	The cook stove in the proposed CPA will be provided with unique identification number(Appliance ID or serial number) to

[31] http://www.kenyalawresourcecenter.org/2011/07/environmental-impact-assessment.html

		a) Acronym of programme b) Acronym of CME & CPA implementer c) Location of CPA d) serial number of cook stoves Monitoring the database (UNFCCC and other GHG ER standards) to check project activity does not generate offsets more than once simultaneously.		ensure that each stove is only counted once. The CME has monitored the requisite databases and confirmed that the proposed SSC-CPA is not registered as any other individual CDM project and is not a CPA in any other PoA. Hence it is confirmed that the project activity does not generate offsets more than once simultaneously.
3.	Specification of technology / measure	Each CPA will deploy rocket, efficient charcoal and/or gasifier technology/measures with following specifications duly certified by National Accreditation Board for Testing and Calibration Laboratories (NABL) [32] accredited / or a reputed laboratory: a. Thermal efficiency of improved cook stove will be greater than or equal to 25% (IS Standard 13152 (Part I):1991 by the Bureau of Indian Standard) b. CO/CO_2 ratio will be less than 0.04[33] c. Total Solid particulate will be less than $2mg/m^3$ d. Surface temperature not exceeding 60°C e. Temperature of synthetic rubber/plastic components if used shall not exceed 60^0C.	Test results	The HomeStove efficiency is 45.3%[35]. The other criteria were not addressed in this case because each of the other criteria apply to implementation in India, whereas this is being implemented in Kenya.

[32] http://www.nabl-india.org/

[33] Except in the case of charcoal stoves, where the ratio should be less than 0.08

[35] KENYA INDUSTRIAL RESEARCH AND DEVELOPMENT INSTITUTE (KIRDI), NAIROBI, KENYA, BIOLITE HOME STOVE TEST REPORT – 11TH MARCH 2016. KIRDI is an approved Regional Testing Center for the Global Alliance for Clean Cookstoves

		In addition to IS 13152 (Part I):1991 Portable/fixed & stable energy efficient stove Biomass savings of more than 50 %[34] CPAs in countries outside India will deploy stoves with technical parameters consistent with those outlined in the methodology being applied (ie with thermal efficiency at least 20%).		
4.	Start date	For each CPA The start date will be earliest date of • Purchase order for the cook stoves • Start date is after the commencement of validation of PoA	Purchase order or record of validation commencement	CPA implementation has not yet begun.
5.	Applicability of applied methodology	Each CPA will satisfy the following applicability criteria described in approved methodology AMS II.G *Energy efficiency measures in thermal applications of non-renewable biomass.* a. This category comprises appliances involving the efficiency improvements in the thermal applications of non renewable biomass. Examples of these technologies and measures include the introduction of high efficiency [36] biomass fired cook stoves[37] or ovens or dryers and/or	AMS-II.G: a. Evidence of qualifying technology b. Evidence of non-renewable biomass consumption since 31 December 1989. ASB0035 a. CPA-DD section A.2. b. Methodology applied c. Collected data demonstrating that the standardized baseline will not be applied to households using LPG or kerosene in the baseline. d. N/A	The proposed CPA satisfies the applicability condition described in version 3, of approved methodology AMS II.G *Energy efficiency measures in thermal applications of non-renewable biomass* a. The efficiency of the cook stove technology to be deployed in the proposed CPA is > 20%[38]. a) Many examples from published literature show how cutting and usage of non-

[34] http://www.mepred.eu/_docs/Improved_stoves-V2.5.I.26.pdf, section 1.2

[36] The efficiency of the project systems as certified by a national standards body or an appropriate certifying agent recognized by it. Alternatively manufacturers' specifications may be used.

[37] Single pot or multi pot portable or in-situ cook stoves with specified efficiency of at least 20%.

[38] KENYA INDUSTRIAL RESEARCH AND DEVELOPMENT INSTITUTE (KIRDI), NAIROBI, KENYA, BIOLITE HOME STOVE TEST REPORT – 11TH MARCH 2016. KIRDI is an approved Regional Testing Center for the Global Alliance for Clean Cookstoves

		improvement of energy efficiency of existing biomass fired cook stoves or ovens or dryers. b. Project participants are able to show that non-renewable biomass has been used since 31 December 1989, using survey methods or referring to published literature, official reports or statistics. If applicable (i.e., in the case of Kenya), each CPA will also satisfy the following applicability criteria as described in the standardized baseline ASB0035: Baseline woody biomass consumption for household cookstoves in Kenya (version 01.0) a. The project activity is implemented in Kenya b. The approved CDM methodology that is applied to the project activity is small-scale methodology AMS-II.G "Energy efficiency measures in thermal applications of non-renewable biomass" and/or small-scale methodology AMS-I.E "Switch from non-renewable biomass for thermal		renewable biomass have been a critical issue on the Kenyan territory in the last decades. In particular, UNESCO [39] reported in 2006. how "Since independence in 1963, Kenya's forest cover has shrunk from 10% of its 582,650 km^2 territory to a mere 1.7%". Likewise, FAO data show a decline in forest areas and growing stock in forest land. In the last 20 years, the forested area in Kenya reduced by 0.35% per year between 1990 and 2000, by 0.34% per year between 2000 and 2005 and by 0.31% per year between 2005 and 2010[40]. Since Kenyan forests have been declining since at least 31 December, 1989, this means that biomass has been consumed at an unsustainable rate (ie non-renewable biomass has been consumed). The proposed CPA satisfies the applicability criteria of

[39] UNESCO (2006). Fighting desertification in Kenya, one tree at a time. Courier, 3, p.7, http://unesdoc.unesco.org/images/0019/001915/191578e.pdf#193846

[40] Source: FAO (2010): Global Forest Resources Assessment 2010, Country Report Kenya, p.9 and p.25, http://www.fao.org/docrep/013/al543E/al543E.pdf

		applications by the user"; c. The standardized values are applicable to households using only firewood and/or charcoal in the pre-project scenario as a cooking fuel; households using LPG and/or kerosene in the pre-project scenario as a cooking fuel are not eligible to apply the standardized values in this document. d. It is not being applied to standalone renewable energy based water treatment technologies under AMS-I.E.		standardized baseline ASB0035: Baseline woody biomass consumption for household cookstoves in Kenya (version 01.0) in the following ways: a. The CPA is implemented exclusively in Kenya b. AMS-II.G. is the methodology being applied c. Any use of LPG and/or kerosene in the baseline scenario is recorded and no such households apply the standardized baseline d. Not applicable, since AMS-I.E. is not being applied.
6.	Additionality	Each CPA will demonstrate the additionality by establishing that in the absence of CDM PoA, the CPA would not occur. This will be done using paragraph 9 of "Standard for the demonstration of additionality, development of eligibility criteria and application of multiple methodologies for Programme of Activities" EB 65 Annex 3,- PoAs that consist of one or more small-scale projects as CPAs shall include eligibility criteria derived from all the relevant requirements of Guidelines on the demonstration of additionality of small-scale project activities, version 09, Annex 27, EB 68 of the	Evidence as per "Guidelines on the demonstration of additionality of small scale project activities of the Simplified modalities and procedures for small scale CDM project activities"	As per Methodological tool Guidelines on the demonstration of additionality of small-scale project activities, version 09, Annex 27, EB 68, para 11 section 2(c), the CPA is automatically additional because each unit is no larger than 5 per cent of the CDM small scale threshold. As calculated in section A.8. on debundling, each unit saves less than 1.8GWh per year per appliance (1% of the small scale threshold). Since each unit is less than 1% of the small scale threshold, each unit is also less than 5% of the small scale

		simplified modalities and procedures for small-scale CDM project activities.		threshold, thus the criterion is satisfied and the CPA is automatically additional.
7.	Stakeholder consultation and environmental impact assessment	Each CPA will undertake local stakeholder consultations following: a. Identification of local stakeholders b. Invitation to local stakeholder consultation or meets c. Demonstrating the CPA project activity d. Inviting comments from stakeholders e. Minutes of the comments Environment Impact Analysis: Environment Impact Analysis: The project activity does not fall under the purview of the Environmental Impact Assessment (EIA) notification of the Ministry of Environment and Forest, Government of India, 2006[41]. Similarly, an EIA is not required for this project activity in Kenya[42] or Uganda[43]. Hence, it is not required for this programme.	Evidence of stakeholder consultation and EIA or exemption.	A Stakeholder consultation in Kenya was already conducted at the PoA level. An EIA is not required for this project activity in Kenya[44].
8.	No ODA diversion	Each CPA will demonstrate that no Official Development Assistance (ODA) is being used.	This may be evidenced through any of the following: a. Undertaking by CPA implementer to the coordinating /managing entity b. Certificate by CPA implementers Chartered Accountant	The proposed CPA does not use any Official Development Assistance (ODA) from other countries. The document submitted is an undertaking from CPA Implementer to the coordinating/managing entity.

[41] http://www.envfor.nic.in/legis/eia/so1533.pdf

[42] http://www.kenyalawresourcecenter.org/2011/07/environmental-impact-assessment.html

[43] http://greenwatch.or.ug/files/downloads/Guide_to_the_Environment_Impact_Assessment_Process-Issue1.pdf

[44] http://www.kenyalawresourcecenter.org/2011/07/environmental-impact-assessment.html

			provided after procurement of the equipment	
9.	Target group	The target group of each CPA will be rural and/or urban households currently using inefficient biomass based traditional cook stoves in biomass deficient regions. Each CPA implementer will market and sell cook stoves to target customers.	Described in CPA-DD	The target group in the proposed CPA are the rural and urban households currently using inefficient biomass based traditional cook stoves in biomass deficient regions of Kenya. The CPA implementer will market and sell cook stoves to target customers. The cook stoves will be distributed / installed through CPA implementer's or suppliers own / third party networks.
10.	Sampling	Each CPA will conduct sampling and surveying for baseline [45] and monitoring of fuel usage and efficiency as appropriate or applicable based on requirements of a. Sampling & survey methods described in the approved methodology AMS II.G, version 03, *Energy efficiency measures in thermal applications of non-renewable biomass* b. General guidelines for sampling and surveys for small-scale CDM project activities, EB 50, Annex 30 , "Standard for sampling and surveys for CDM project activities and programme of activities", version 03.0, Annex 4,EB 69 and "Guidelines for sampling and surveys	Described in CPA-DD	Since the baseline was established using default values for B_{old} and a calculated value based on publicly available data for f_{NRB}, no sampling was conducted in the baseline. Monitoring will be based on "Standard for sampling and surveys for CDM project activities and programme of activities", version 03.0, Annex 4,EB 69 and "Guidelines for sampling and surveys for CDM project activities and programme of activities", version 02.0, Annex 5, EB 69.

[45]Baseline survey to establish fuel consumption patterns, prevalent technologies. Where appropriate, sampling across multiple CPAs is allowed.

		for CDM project activities and programme of activities", version 02.0, Annex 5, EB 69.		
11.	Small-scale threshold	Each CPA will meet the following small-scale threshold criteria a. Each CPA will have efficiency improvements not exceeding the equivalent of 180 gigawatt hours (GWh) per year every year throughout the crediting period.	Confirmation by applying the equations outlined in the CPA-DD	The cook stove to be deployed in the proposed CPA will have the efficiency improvement of 179.46 GWh/year, which is less than the equivalent of 180 $GWh_{thermal}$ per year. This check will be conducted each year, every year throughout the crediting period.
12.	Debundling	Each CPA will not undergo debundling check as per EB 54 Annex 13, "Guidelines on assessment of debundling for SSC project activities" para 10 a. If each of the independent subsystems/measures (e.g., biogas digester, solar home system) 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 threshold to prove the activity is not a debundled action is deducted from the small scale threshold for each SSC-CPA, which corresponds to 180GWh [46] thermal energy per year as follows: 1% of	Confirmation by calculating thermal output of one independent subsystem/measure.	The thermal energy savings of the proposed CPA is 0.0150 GWh/appliance (calculation is demonstrated in section A.8. which is less than the threshold of 1.8 GWh/y/appliance. Hence this CPA will not undergo debundling check.

[46] As clarified in SSC_223, The SSC WG agreed to clarify therefore AMS-II.G is applicable to project activities with maximum thermal energy savings of 180 GWh per year.

		180GWh = 1.8GWh. This will be demonstrated in section A.8. of each SSC-CPA DD.		

Additionality demonstration:

Since the PoA requires that each CPA prove additionality at the CPA level, the following case is made for additionality.

As per Methodological tool Guidelines on the demonstration of additionality of small-scale project activities, version 09, Annex 27, EB 68, para 11 section 2(c), the CPA is automatically additional because each unit is no larger than 5 per cent of the CDM small scale threshold. As calculated in section A.8. on debundling, each unit saves less than 1.8GWh per year per appliance (1% of the small scale threshold). Since each unit is less than 1% of the small scale threshold, each unit is also less than 5% of the small scale threshold, thus the criterion is satisfied and the CPA is automatically additional.

Appendix 1. Contact information of CPA implementers

Organization name	INTERNATIONAL CARBON PORTFOLIO LTD.
Country	Republic of Korea
Address	9F, N'deavor Tower, 45, Seocho-dearo 74-gil, Seocho-gu, Seoul 06626
Telephone	+82 2 3487 6050
Fax	NA
E-mail	contact@i-c-p.info
Website	NA
Contact person	Pablo Fernandez de Mello e Souza

Appendix 2. Affirmation regarding public funding

Public funding from Annex I countries and diversion of official development assistance (ODA) is not involved in this project activity.

Appendix 3. Further background information on ex ante calculation of emission reductions

NA

Appendix 4. Further background information on monitoring plan

Monitoring information provided in section B.5. of this document.

Appendix 5. Summary report of comments received from local stakeholders

See section E.2.

Appendix 6. Summary of post-registration changes

NA

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Document information

Version	*Date*	*Description*
09.0	31 May 2019	Revision to: • Ensure consistency with version 02.0 of the "CDM project standard for programmes of activities" (CDM-EB93-A07-STAN); Make editorial improvements.
08.1	20 October 2017	Editorial revision to remove appendix "Applicability of methodologies and standardized baselines" from the main part of the form which had been mistakenly kept in the previous version.
08.0	28 June 2017	Revision to: • Remove appendix "Applicability of methodologies and standardized baselines" as the appendix is not relevant at the CPA level; • Make editorial improvement.
07.0	7 June 2017	Revision to: • Improve consistency with the "CDM project standard for programmes of activities" and with the PDD and PoA-DD forms; • Make editorial improvement.
06.0	24 May 2017	Revision to: • Ensure consistency with the "Standard: CDM project standard for programme of activities" (CDM-EB93-A07-STAN) (version 01.0); • Incorporate the "Component project activity design document form for small-scale component project activities" (CDM-SSC-CPA-DD-FORM); • Make editorial improvement.
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	Revision to: • 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; • Make editorial improvement.

Version	*Date*	*Description*
03.0	25 June 2014	Revisions to: • Include the Attachment: Instructions for filling out the component project activity design document form for CDM component project activities (these instructions supersede the "Guidelines for completing the component project activity design document form" (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-CPA-DD-FORM in A.13. and Appendix 1; • Add general instructions on post-registration changes in paragraph 4 and 5 of general instructions and Appendix 6; • Change the reference number from F-CDM-CPA-DD to CDM-CPA-DD-FORM; • Make editorial improvement.
02.0	13 March 2012	Revision required to ensure consistency with the "Guidelines for completing the component project activity design document form" (EB 66, Annex 16).
01.0	27 July 2007	EB 33, Annex 42 Initial adoption.

Decision Class: Regulatory
Document Type: Form
Business Function: Registration
Keywords: component project activity, project design document