



**Monitoring report form for CDM programme of activities  
(Version 03.0)**

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

**MONITORING REPORT**

<b>Title of the PoA</b>	Top Third Ventures Stove Programme	
<b>UNFCCC reference number of the PoA</b>	9265	
<b>Version numbers of the PoA-DD applicable to this monitoring report</b>	1.3	
<b>Version number of this monitoring report</b>	1.0	
<b>Completion date of this monitoring report</b>	30/09/2019	
<b>Monitoring period number</b>	1 (First monitoring period)	
<b>Duration of this monitoring period</b>	27/12/2012 to 24/09/2019 (first and last day included) <sup>1</sup>	
<b>Monitoring report number for this monitoring period</b>	1.0	
<b>Coordinating/managing entity</b>	BURN Manufacturing Co.	
<b>Host Parties</b>	<b>Host Party of the PoA</b>	<b>Is this the host Party of a CPA covered in this monitoring report? (yes/no)</b>
	Republic of Kenya	Yes
	Democratic Republic of the Congo (DRC)	No
<b>Applied methodologies and standardized baselines</b>	AMS-II.G "Energy efficiency measures in thermal applications of non-renewable biomass" (Version 04.0)	
<b>Sectoral scopes</b>	03	
<b>Amount of GHG emission reductions or net anthropogenic GHG removals achieved by all CPAs covered in this monitoring report in this monitoring period</b>	<b>Amount achieved before 1 January 2013</b>	<b>Amount achieved from 1 January 2013</b>
	0	250 tCO <sub>2</sub> e
<b>Amount of GHG emission reductions or net anthropogenic GHG removals estimated ex ante for this monitoring</b>	4,779 tCO <sub>2</sub> e	

<sup>1</sup> No CERs are claimed for the period between 27/12/2012 to 17/09/2019. CERs are claimed for the period between 18/09/2019 and 24/09/2019 (both days included).

period in the CPA-DDs for the CPAs covered in this monitoring report	
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## **PART I      Monitoring of programme of activities (PoA)**

### **SECTION A.    Description of PoA**

#### **A.1.    General description of PoA**

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The stated goal of the PoA is to achieve widespread distribution and effective use of efficient cooking technologies in low-income rural and urban households as well as institutions and SMEs. Carbon revenues earned under the PoA will be used to:

- Subsidize the cost of efficient cookstoves to the consumer<sup>2</sup>; and/or
- Invest in the research and development of new and improved efficient technologies; and/or
- Support the dissemination of efficient cookstoves in remote areas with poor infrastructure.

The measures listed above will contribute to the wide-spread use of efficient stoves within the boundary of the PoA.

The widespread use of efficient cooking technologies will result in vastly reduced woody biomass consumption. Reduced woody biomass consumption will result in GHG emission reductions, relative to the applicable non-renewable biomass factor.

The Top Third Ventures Stove Programme is an activity coordinated and managed by BURN Manufacturing Co. The PoA covers Sector 3 and is a Type 2 programme as under AMS-II.G Version 04.0. The efficient cooking technologies supported by the PoA will have a thermal efficiency value of at least 20 per cent. The PoA will contribute to the sustainable development of the host countries in the following ways:

- Reduce demand for biomass for thermal energy production
- Contribute to the alleviation of the burden on forests within the boundary of the PoA
- Improve the quality of in-door air in households cooking with non-renewable biomass

The CME of the PoA is BURN Manufacturing Co. BURN Manufacturing Co. is a leading developer, manufacturer and distributor of clean cookstoves in sub-Saharan Africa.

The Coordinating or Managing Entity (CME) will manage the PoA. The CME will coordinate with CPA Implementers to ensure collection of all data listed under the monitoring plan as well as ensuring the satisfactory performance of all technology types implemented under the PoA.

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<sup>2</sup> This means that the efficient cookstove is either partially or fully subsidized.

## A.1.1. Corresponding generic component project activities (CPAs)

Title and reference number of the corresponding generic CPA	Version of the PoA-DD	Sectoral scopes	Applied methodologies and standardized baselines
<b>Title:</b> Top Third Ventures Stove Programme CPA ##### <b>Reference:</b> Generic CPA <b>Identification:</b> Part II of PoA-DD, version 1.3, dated 22/06/2019, <a href="https://cdm.unfccc.int/UserManagement/FileStorage/JN6FQI8G92CKP010M4SZ3V7HLYETU5">https://cdm.unfccc.int/UserManagement/FileStorage/JN6FQI8G92CKP010M4SZ3V7HLYETU5</a>	version 1.3, dated 22/06/2019	3	AMS-II.G “Energy efficiency measures in thermal applications of non-renewable biomass” (Version 04.0) <a href="https://cdm.unfccc.int/UserManagement/FileStorage/O6X9DCFSAZ5LRNB207JK3GQVUYIET1">https://cdm.unfccc.int/UserManagement/FileStorage/O6X9DCFSAZ5LRNB207JK3GQVUYIET1</a>

## A.1.2. CPAs included in the PoA

Title and UNFCCC reference number of the CPA	Version of the PoA-DD	Title and reference number of the corresponding generic CPA	Crediting period type and duration	Covered in this monitoring report? (yes/no)
Top Third Ventures Stove Programme CPA KE0001 (Kenya) Version: 1.2, Date: 05/11/2012 9265-P1-0001-CP1	version 1.3, dated 22/06/2019	<b>Title:</b> Top Third Ventures Stove Programme CPA ##### <b>Reference:</b> Generic CPA <b>Identification:</b> Part II of PoA-DD, version 1.3, dated 22/06/2019, <a href="https://cdm.unfccc.int/UserManagement/FileStorage/JN6FQI8G92CKPO10M4SZ3V7HLYETU5">https://cdm.unfccc.int/UserManagement/FileStorage/JN6FQI8G92CKPO10M4SZ3V7HLYETU5</a>	Fixed 27/12/2012 - 26/12/2022	No
Top Third Ventures Stove Programme CPA KE0002 – BURN Efficient Cookstoves for Kenya supported by Republic of Korea (Kenya) Version: 3.1 Date: 16/09/2019 9265-P1-0002-CP1			Fixed 18/09/2019 - 17/09/2029	Yes
Top Third Ventures Stove Programme CPA KE0003 – BURN Efficient Cookstoves for Kenya supported by Republic of Korea (Kenya) Version: 3.1 Date: 16/09/2019 9265-P1-0003-CP1			Fixed 18/09/2019 - 17/09/2029	Yes
Top Third Ventures Stove Programme CPA KE0004 – BURN Efficient Cookstoves for Kenya supported by Republic of Korea (Kenya) Version: 3.1 Date: 16/09/2019 9265-P1-0004-CP1			Fixed 18/09/2019 - 17/09/2029	Yes
Top Third Ventures Stove Programme CPA			Fixed 18/09/2019	Yes

KE0005 – BURN Efficient Cookstoves for Kenya supported by Republic of Korea (Kenya) Version: 3.1 Date: 16/09/2019 9265-P1-0005-CP1			- 17/09/2029	
Top Third Ventures Stove Programme CPA KE0006 – BURN Efficient Cookstoves for Kenya supported by Republic of Korea (Kenya) Version: 3.1 Date: 16/09/2019 9265-P1-0006-CP1			Fixed 18/09/2019 - 17/09/2029	Yes

## A.2. Coordinating/managing entity

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The CME of the PoA is BURN Manufacturing Co. The responsible person for completing the CDM-PoA-MR-Form is as follows:

Johann Thaler  
Managing Director  
mkaarbon safari GmbH  
[johann.thaler@mkaarbonsafari.com](mailto:johann.thaler@mkaarbonsafari.com)

## SECTION B. Implementation of PoA

### B.1. Description of implemented PoA

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The CPAs (9265-P1-0002-CP1, 9265-P1-0003-CP1, 9265-P1-0004-CP1, 9265-P1-0005-CP1 and 9265-P1-0006-CP1) covered in this monitoring report follow the same management system as described below:

1. The CME / CPA implementer has collected and reported all required data to effectively monitor the emission reductions of the CPAs in accordance with the monitoring plan detailed in section B.7.2 of the PoA-DD. At the time of distribution, stove and end-user related information has been automatically recorded through the EcoMobile platform and transferred into the electronic database management system operated by the CME.
2. The CME / CPA implementer operates and manages an electronic data management system that stores and tracks all efficient cooking technologies for each CPA under the PoA. The database contains the following information:
  - a) Unique serial number (USN) representing the stove number
  - b) CPA-DD under which the stove is operating
  - c) End-user information (name, county, village, mobile number)
  - d) Stove model
  - e) Distribution date
 Linking the USN to the contact details of the end-user allows for the tracking and identification of each efficient cooking unit.

The USN has the following format comprising of 9 digits:

1 <sup>st</sup> digit	2 <sup>nd</sup> digit	3 <sup>rd</sup>	4 <sup>th</sup>	5 <sup>th</sup>	6 <sup>th</sup>	7 <sup>th</sup>	8 <sup>th</sup>	9 <sup>th</sup>
Product ID	100000 <sup>th</sup>	10000 <sup>th</sup>	1000 <sup>th</sup>	100 <sup>th</sup>	10 <sup>th</sup>	Random	Random	1 <sup>st</sup>
ID	S1	S2	S3	S4	S5	R1	R2	S6

Each section on the USN will identify the product as follows:

- Product type : the first digit identifies the stove type (Kuniokoa stove).
- #Production number: S1 to S6 are digit slots for a sequential numbering ordered by time of production, allowing for 1 million unique serial numbers. For instance, the first stove off the line would have “000000” for its S1-S6 digits.
- Random digits: R1 and R2 are 2 random digits placed in slots 7 & 8 , to make the USN unpredictable to outside parties.

Example for USN: 202728110

- “2” stands for Kuniokoa product ID
- “027280” for S1-S6, meaning it was the 27,281<sup>st</sup> Kuniokoa produced
- “11” for R1-R2, the random digits

- The distribution information in the electronic database management system is reviewed by the After Sales/distribution Manager. It is also the After Sales/distribution Manager who will report the full-time equivalent appliances operating during the monitoring period to the CPA implementer as drawn from the distribution records in the electronic database management system.
- The USN will avoid double counting of emission reductions. Each stove under this PoA is unquestionably assigned to this PoA and a single CPA under this PoA. The USN is clearly visible on the efficient cooking technology throughout the life of the product as well as stored in the electronic data management system. If there is any doubt regarding the USN of a product, it is excluded from the emission reduction calculation. The CME has checked the electronic database to avoid any identical USN. No identical USN have been found.
- End-users provided their approval at the time of distribution to cede all rights, title and interest to any CERs resulting from the use of the ICS to the CPA implementer.
- The CME / CPA implementer coordinated all ex-post monitoring activities in the PoA, i.e. amongst others
  - Implementation of the monitoring plan
  - Determined the sample size as per the sampling plan and randomly selected the samples to be monitored. The sampling has been conducted across CPAs. Since all of the CPAs are homogenous, i.e. all CPAs apply the same ICS model and fuel and all target the same end-users (i.e. households) in the same geographical boundary (Kenya).
  - Used monitored data for ex-post emission reduction calculations.
- The CME / CPA implementer checked and recorded the following monitored key parameters:
  - Efficiency of the system being deployed as part of the project activity
  - Number of full-time equivalent appliances in operation during the monitoring period
  - Usage rate of the technology employed by the project activity

8. Calculated emission reductions based on monitored data and preparation of monitoring report.

## **B.2. Post-registration changes to PoA**

### **B.2.1. Corrections**

>> N/A

### **B.2.2. Inclusion of monitoring plan**

>> N/A

### **B.2.3. Permanent changes to the registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines, or other methodological regulatory documents**

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A request for approval of changes was submitted to UNFCCC on 25/06/2019 and has been approved on 11/09/2019.

The request for approval of changes contains the following changes:

- Change of CME from 'Top Third Ventures Limited' to 'Burn Manufacturing Co.';
- Inclusion of Democratic Republic of the Congo as additional host party in the PoA;
- Update of the additionality section in the PoA-DD;
- Removal of the aggregated small-scale threshold;
- Update of the methodology applicability section;
- Update of the ex-ante parameter section;
- Update of eligibility criteria;
- Update of sections Environmental Impacts and Stakeholder Consultation corresponding to the host country of DRC;
- Permanent changes to the registered monitoring plan (amongst others introducing the option of a single sampling plan);
- Several corrections throughout the PoA-DD;

For details, see PoA-DD

([https://cdm.unfccc.int/ProgrammeOfActivities/poa\\_db/BSVR8KUNAXW0LI1PGC6H42Y3JD9EQ7/view](https://cdm.unfccc.int/ProgrammeOfActivities/poa_db/BSVR8KUNAXW0LI1PGC6H42Y3JD9EQ7/view)) and DOE PRC Validation Report.

### **B.2.4. Changes to programme design**

>> N/A

### **B.2.5. Changes specific to afforestation or reforestation activities**

>> N/A

## **PART II Monitoring of CPAs**

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This Monitoring Report covers five CPAs included in the concerned monitoring period. These CPAs have the same project boundary, distribute the same stove type and follow a common generic CPA as identified in section A.1.1, Part I of this monitoring report. The following sections therefore represent all these five CPAs.

## SECTION C. Implementation of CPAs

### C.1. Description of implemented CPAs

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*a) Purpose of the specific-case CPA(s) and the measures taken for GHG emission reductions or net GHG removals by sinks*

The purpose of the CPA is to achieve widespread distribution and effective use of efficient cooking technologies in low-income rural households. The widespread use of efficient cooking technologies will result in vastly reduced woody biomass consumption. Reduced woody biomass consumption will result in GHG emission reductions, relative to the applicable non-renewable biomass factor.

The CPA Implementer of all five CPAs included in the concerned monitoring period is Korea Carbon Management Ltd. (KCM), a company registered in the Republic of Korea. KCM provides all implementation and ongoing project operation costs for the project under this CPA.

*b) Description of the technology employed and installed equipment and/or infrastructure, including information requested by the eligibility criteria;*

The efficient cooking stove relies on two main design principles to achieve a high thermal efficiency, namely improved airflow and thermal insulation. Improved airflow design allows better fuel-air mixing and regulation of the fuel-air mixture, increasing the rate at which oxygen is delivered to fuel in the combustion chamber. The increased flow rate of oxygen allows the combustion to occur at a higher temperature. The thermal insulation of the efficient cooking stove ensures thermal energy is directed to the cooking surface and is does not become waste heat.

The CPAs deploy the efficient firewood cooking stove known as Kuniokoa, which has been designed and developed by BURN Manufacturing Co.. Please see the technical specifications in the following table.

Stove Manufacturer		BURN
Stove Model		Kuniokoa
Stove Type		Natural draft, Side-Feed Semi-Gasifier Stove
Materials		
Stove Body		CRCA Carbon Steel painted high gloss black epoxy powder coat
Pot Rest		StainlessSteel
Burning Chamber		StainlessSteel
Fuel FeedingDoor		StainlessSteel
Stick Shelf		CRCA
Legs		Aluzinc
Measurements		
Height	cm	80.5 cm
Diameter (stove top)	cm	28.2 cm
Fuel FeedingDoorOpening	cm	10.6 cm
Weight	kg	4 kg
Fuel Chamber Volume	cm <sup>3</sup>	144.3 cm <sup>3</sup>
Packaging Dimensions	cm	30.0 L x 30.0 W x 32.5 H



The following table informs about the implementation status of the CPAs:

CPA	Start date as per CPA-DD	Date of first distribution	Fuel used in the stove	Stove model	Total number of stoves
9265-P1-0002-CP1	10/07/2019	10/07/2019	Firewood	Kuniokoa	1,015
9265-P1-0003-CP1	10/07/2019	10/07/2019	Firewood	Kuniokoa	991
9265-P1-0004-CP1	10/07/2019	10/07/2019	Firewood	Kuniokoa	1,004
9265-P1-0005-CP1	10/07/2019	10/07/2019	Firewood	Kuniokoa	969
9265-P1-0006-CP1	10/07/2019	10/07/2019	Firewood	Kuniokoa	974
<b>TOTAL</b>					<b>4,953</b>

*c) Total GHG emission reductions or net GHG removals by sinks achieved in this monitoring period for the specific-case CPA(s), including information on how double counting is avoided*

CPA	Emission Reductions tCO <sub>2</sub> e
9265-P1-0002-CP1	51
9265-P1-0003-CP1	50
9265-P1-0004-CP1	51
9265-P1-0005-CP1	49
9265-P1-0006-CP1	49
<b>Total</b>	<b>250</b>

Each stove under this PoA has its unique serial number (USN) which is unquestionably assigned to this PoA and a single CPA under this PoA. The USN is clearly visible on the efficient cooking technology throughout the life of the product as well as stored in the electronic data management system. Please refer to the ER excel spreadsheet, worksheet 'Database' in which each stove with its unique serial number along with end-user information, date of distribution and CPA under which the stove is operating, are mentioned.

## C.2. Location of CPAs

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All the CPAs have a common project boundary which is the Republic of Kenya.

GPS coordinates KENYA: 0°10'36.73" N 37°54'29.98" E (Source: <https://latitude.to/map/ke/kenya>, accessed on 23/09/2019)





### C.3. Post-registration changes to CPAs

#### C.3.1. Temporary deviations from the monitoring plans in the included CPA-DDs, applied methodologies, standardized baselines or other methodological regulatory documents

>> N/A

#### C.3.2. Corrections

>> N/A

#### C.3.3. Changes to the start date of the crediting period

>> N/A

#### C.3.4. Inclusion of monitoring plan

>> N/A

#### C.3.5. Permanent changes to the included monitoring plans, or permanent deviation of monitoring from the applied methodologies, standardized baselines, or other methodological regulatory documents

>> N/A

#### C.3.6. Changes to project design

>> N/A

#### C.3.7. Changes specific to afforestation or reforestation CPA

>> N/A

### SECTION D. Description of monitoring system of CPAs

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Stoves were distributed to end-users by BURN directly or through dedicated distributors. Distributors were trained on the stove distribution and data collection procedures.

The CME operates and manages an electronic data management system that stores information on and track all efficient cooking technologies under the PoA. The system contains the following information for each efficient cooking stove/end-user:

- 1) Unique Serial Number (USN) representing the stove number;
- 2) CPA under which the stove is operating;
- 3) Contact details of the end-users (name, county, village, mobile number);
- 4) Stove Type;
- 5) Distribution date;
- 6) End-users confirmation to waive any rights on the CERs to the CPA implementer

Linking the USN to the contact details of the end-user allows for the tracking and identification of each efficient cooking unit and to avoid double-counting.

## SECTION E. Data and parameters

### E.1. Data and parameters fixed ex ante

(Copy this table for each data or parameter.)

<b>Data/Parameter</b>	$f_{NRB,y}$
<b>Unit</b>	Fraction
<b>Description</b>	Fraction of woody biomass saved by the project activity in year y that can be established as non-renewable biomass
<b>Source of data</b>	<ul style="list-style-type: none"> <li>-Worldbank Data (for population figure)</li> <li>-UN (for annual population growth)</li> <li>-Worldbank Data (for proportion urban to rural population)</li> <li>-WISDOM report 'Analysis of woodfuel supply, demand and sustainability in Kenya' (for average woodfuel consumption)</li> <li>-Global Forest Resources Assessment 2015, Country Report Kenya (for forest areas and forest loss)</li> <li>-GTZ Eastern Africa Online Resource Base (for MAI)</li> <li>-Protected Planet (for protected areas)</li> </ul>
<b>Value(s) applied</b>	0.914
<b>Choice of data or measurement methods and procedures</b>	<p>Calculated</p> <p>As per registered CPA-DDs</p>
<b>Purpose of data/parameter</b>	Calculation of baseline emissions
<b>Additional comments</b>	<p>This calculation follows the methodological tool: 'Calculation of the fraction of non-renewable biomass', version 02.0</p> <p>The calculated <math>f_{NRB}</math> is slightly below the national default value of 92%<sup>3</sup> which expired on September 18, 2017.</p>

<b>Data/Parameter</b>	$\eta_{old}$
<b>Unit</b>	Fraction
<b>Description</b>	Efficiency of the system being replaced

<sup>3</sup> <https://cdm.unfccc.int/DNA/fNRB/index.html>

Source of data	-AMS-II.G, ver. 04.0 and -Surveys/studies: 2015/16 Kenya Integrated Household Budget Survey and Practical Action, Gender and Equity in Bioenergy Access and Delivery in Kenya
Value(s) applied	0.104
Choice of data or measurement methods and procedures	As per registered CPA-DDs
Purpose of data/parameter	Calculation of baseline emissions
Additional comments	See ex-ante ER calculation excel spreadsheet/worksheet 'Baseline stove efficiency' submitted at the time of CPA inclusion for the calculation of the value.

<b>Data/Parameter</b>	B <sub>old,p</sub>
Unit	t/person/year
Description	Annual quantity of woody biomass that would have been used per person in the household in the absence of the project activity to generate useful thermal energy equivalent to that provided by the project devices
Source of data	WISDOM report 'Analysis of woodfuel supply, demand and sustainability in Kenya', Table A1.2.  KIHBS 2015/16, Table 3.18  Default IPCC value taken from <a href="https://www.ipcc-nggip.iges.or.jp/public/gl/guidelin/ch1ref3.pdf">https://www.ipcc-nggip.iges.or.jp/public/gl/guidelin/ch1ref3.pdf</a> (page 1.45) for conversion factor from charcoal to fuelwood (6:1)
Value(s) applied	0.627
Choice of data or measurement methods and procedures	As per registered CPA-DDs
Purpose of data/parameter	Calculation of baseline emissions
Additional comments	See ex-ante ER calculation excel spreadsheet/worksheet 'Baseline fuelwood consumption' submitted at the time of CPA inclusion for the calculation of the value.

<b>Data/Parameter</b>	N <sub>p,HH</sub>
Unit	People/HH
Description	Number of people per household in rural areas of Kenya
Source of data	Global Data Lab
Value(s) applied	5.83
Choice of data or measurement methods and procedures	As per registered CPA-DDs
Purpose of data/parameter	Calculation of baseline emissions
Additional comments	-

<b>Data/Parameter</b>	L
Unit	Fraction
Description	Net to gross adjustment factor to account for leakages

Source of data	AMS-II.G, ver. 4, paragraph 22(c)
Value(s) applied	0.95
Choice of data or measurement methods and procedures	As per registered CPA-DDs
Purpose of data/parameter	Calculation of leakage
Additional comments	The 0.95 leakage default factor will be applied to all CPAs.

<b>Data/Parameter</b>	$EF_{\text{projected, fossil fuel}}$
Unit	tCO <sub>2</sub> /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.  As per registered CPA-DDs
Purpose of data/parameter	Calculation of baseline emissions
Additional comments	-

<b>Data/Parameter</b>	$NCV_{\text{biomass}}$
Unit	TJ/tonne
Description	Net calorific value of the non-renewable woody biomass that is substituted
Source of data	IPCC default for wood fuel
Value(s) applied	0.0156
Choice of data or measurement methods and procedures	This is the IPCC default value as per volume 2, chapter 1, table 1.2.  As per registered CPA-DDs
Purpose of data/parameter	Calculation of baseline emissions
Additional comments	-

## E.2. Data and parameters monitored

(Copy this table for each data or parameter.)

<b>Data/Parameter</b>	$\eta_{\text{new}}$
Unit	Fraction
Description	Efficiency of the system being deployed as part of the project activity
Measured/calculated/default	Measured
Source of data	Efficiency values from water boiling tests (WBTs) conducted on a representative sample of appliances
Value(s) of monitored parameter	0.416

Monitoring equipment	<b>Thermometer:</b> Brand: Smart Sensor Model: AS887 Serial Number: 3438813 Measure range: - 200°C ~ 1372°C (-328°F ~ 2501°F) Resolution accuracy: 0.1°C/°F <1000° Number of units: 1
	<b>Weighing Scale:</b> Brand: Endel Model: ECS-H+ Serial Number: 5412039022 Accuracy: 0.2g Capacity: 15kg Number of units: 1
	Brand: Electronic Weighing Balance Model: XY30MA Serial Number: 2131801080 Accuracy: 1g Capacity 31kg Number of units: 1
	<b>Oven:</b> Brand: Digi systems Model: DSO-300D Serial Number: 03-16070171 Measure range: Ambient +5°C – 200°C Accuracy: ±0.5°C at 100°C, ±1.0°C at 200°C Resolution: 0.1°C Number of units: 1
Measuring/reading/recording frequency	Biennial <sup>4</sup>
Calculation method (if applicable)	WBT protocol, version 4.2.3
QA/QC procedures	WBTs were conducted in line with the WBT protocol, version 4.2.3 by experienced/trained personnel. All instruments were calibrated prior to conducting the WBTs.
Purpose of data/parameter	Calculation of baseline emissions
Additional comments	-

<b>Data/Parameter</b>	N <sub>y,FTE</sub>
Unit	-
Description	Number of full-time equivalent appliances in operation during the monitoring period
Measured/calculated/default	Calculated
Source of data	Distribution record in electronic data management system detailing serial numbers and date of distribution for appliances.
Value(s) of monitored parameter	92.6
Monitoring equipment	Not applicable
Measuring/reading/recording frequency	Continuously

<sup>4</sup> The sampling plan suggests either annual or biennial sampling.

Calculation method (if applicable)	<p>The parameter is calculated through the number of distributed stoves and the stove operating fraction during the monitoring period.</p> <p>Each ICS entered into the distribution database will be linked to a distribution date (recorded during distribution). Thus, for any monitoring period it is possible to calculate the period of time for which the stoves included in the emissions reduction calculations are deemed operating. If e.g. a stove has been operating for 180 days, then the operating fraction is 0.493 (=180/365 days). A stove will be counted as operational from the day after next following the stove distribution.</p>
QA/QC procedures	All data in the electronic data management system can be verified through a mobile registration platform (EchoMobile).
Purpose of data/parameter	Calculation of baseline emissions
Additional comments	During monitoring, if it has been found that more than one BURN Kuniokoa ICS is being used per household, any such additional ICS has been excluded from the emission reduction calculations by discounting ICS population from the database in equivalent proportion. This is reflected in the ER calculation by the parameter $N_{s,HH}$ .

<b>Data/Parameter</b>	$R_{y,usage}$
Unit	fraction
Description	Usage rate of the technology employed by the project activity
Measured/calculated/default	Measured
Source of data	Representative sample survey of end-users under the project activity
Value(s) of monitored parameter	0.891
Monitoring equipment	Not applicable
Measuring/reading/recording frequency	Biennial <sup>5</sup>
Calculation method (if applicable)	The stove operation rate is multiplied with the percentage to what end-user use the project stove. This results in the usage rate.
QA/QC procedures	Following the CDM PoA Sampling Standard, version 07.0, paragraph 21 and 22, a 95 per cent confidence and 10 per cent margin of error are required. Since CPAs are composed of microscale CDM units and sampling is conducted across CPAs. In the instance where the sample size fails to satisfy the confidence and margin of error requirements, either the lower bound of the 95 per cent confidence interval may be chosen or the sample size will be increased until the necessary precision is achieved.
Purpose of data/parameter	Calculation of baseline emissions
Additional comments	-

### E.3. Implementation of sampling plan

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The following parameters have been determined through sampling as per the registered monitoring plan:

- i.  $\eta_{new}$  - Efficiency of the system being deployed as part of the project activity

<sup>5</sup> The sampling plan suggests either annual or biennial sampling.

- ii.  $R_{y,usage}$  - Usage rate of the technology employed by the project activity

No eligible stoves were distributed in 9265-P1-0001-CP1 till the end of monitoring period. Hence, no ERs are being claimed for 9265-P1-0001-CP1 for this entire monitoring period. 9265-P1-0002-CP1 to 9265-P1-0006-CP1 have been monitored under a single sampling plan for this monitoring period covering all 5 CPAs. The populations of all CPAs in the group were combined together, the sample size is determined and a single survey is undertaken to collect the data. A single sampling plan has been applied, since all CPAs in the group are homogenous, i.e. apply the same ICS model (Kuniokoa stove) and fuel (firewood), and target the same end-users (i.e. households) within the same geographical area, i.e. Kenya.

Households were randomly selected by using the Excel random generator<sup>6</sup> for each of the two parameters using all data entries in the database as the sampling frame. The sampled households for WBTs were asked prior to conducting the WBT whether they use the stove. Since WBTs are only to be conducted on operational stoves as per the registered monitoring plan.

In terms of the usage/monitoring survey, a questionnaire was designed in excel which was then transferred to an EcoMobile<sup>7</sup> app, in order to minimize the errors during data collection and transfer of data.

In terms of WBTs, WBT protocol 4.2.3 along with the WBT excel spreadsheet, publicly available at Clean Cooking Alliance website<sup>8</sup> have been used.

Enumerators doing the usage/monitoring surveys and staff conducting the WBTs have been appropriately trained before. Evidence is available to the DOE upon request.

The sample results comply with the 95/10 confidence/precision as required by paragraph 22 of the Standard 'Sampling and surveys for CDM project activities and PoAs', version 07.0.

## SECTION F. Calculation of emission reductions or net anthropogenic removals

### F.1. Calculation of baseline emissions or baseline net removals

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$$ER_y = B_{y,savings} \times f_{NRB,y} \times NCV_{biomass} \times EF_{projected_{fossilfuel}}$$

<sup>6</sup> The Randbetween and Vlookup functions were used in excel to create a random list of households. The CME/CPA implementer went through both lists (one for monitoring/usage survey and the other one for WBTs) top-down until the necessary number of sampled households was obtained.

<sup>7</sup> <https://www.echomobile.org>

<sup>8</sup> <https://www.cleancookingalliance.org/technology-and-fuels/testing/protocols.html>

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

$$B_{old} = B_{old,appliance} \times N_y \times L_{Total}$$

$$B_{old,appliance} = \frac{B_{old,HH}}{N_{s,HH}}$$

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

Parameter title	Parameter explanation	Unit	Values					TOTAL	Data Source
			CPA KE0002	CPA KE0003	CPA KE0004	CPA KE0005	CPA KE0006		
$N_{y,ST}$	Number of stoves (Full year equivalent under consideration of monitoring period)	-	19	18	19	18	18	92,65	Database
$R_{s,ST}$	Usage rate	-	0,891	0,891	0,891	0,891	0,891	0,891	Assumptions: 99% stove operation rate and 10% continued baseline stove use (stove stacking)
$B_{old,P}$	Annual quantity of woody biomass that would have been used per person in rural household in the absence of the project activity to generate useful thermal energy equivalent to that provided by the project devices	t/person/year	0,627	0,627	0,627	0,627	0,627	0,627	Determined ex-ante (see CPA-DDs KE0002-KE0006)
$N_{p,HH}$	Number of people per household in rural areas of Kenya	people/HH	5,83	5,83	5,83	5,83	5,83	5,83	Determined ex-ante (see CPA-DDs KE0002-KE0006)
$B_{old,HH}$	Annual quantity of woody biomass consumed in the household in the baseline	t/HH/year	3,657436738	3,657436738	3,657436738	3,657436738	3,657436738	3,657436738	Calculated
$N_{s,HH}$	Number of BURN stoves per household	Number	1,00	1,00	1,00	1,00	1,00	1,00	Database
$B_{old,appliance}$	Annual quantity of woody biomass consumed per device in the baseline	t/annum/stove	3,66	3,66	3,66	3,66	3,66	3,66	Calculated
$L$	Leakage	-	0,95	0,95	0,95	0,95	0,95	0,95	Determined ex-ante (see CPA-DDs KE0002-KE0006)
$B_{old}$	Annual quantity of woody biomass consumed per device in the baseline taking into account usage rate, stove stacking, leakage	t/annum	3,1	3,1	3,1	3,1	3,1	3,1	Calculated
$\eta_{old}$	Efficiency of baseline device	-	0,104	0,104	0,104	0,104	0,104	0,104	Determined ex-ante (see CPA-DDs KE0002-KE0006)
$\eta_{new}$	Efficiency of project device (BURN stove)	-	0,416	0,416	0,416	0,416	0,416	0,416	WBT
$B_{y,savings}$	Quantity of woody biomass that is saved per project device	t/annum	2,3	2,3	2,3	2,3	2,3	2,3	Calculated
$f_{BIO,y}$	Fraction of woody biomass that can be established as non-renewable biomass	-	0,914	0,914	0,914	0,914	0,914	0,914	Determined ex-ante (see CPA-DDs KE0002-KE0006)
$NCV_{BIOBIO}$	Net calorific value of the non-renewable woody biomass that is substituted	TJ/t	0,0156	0,0156	0,0156	0,0156	0,0156	0,0156	Determined ex-ante (see CPA-DDs KE0002-KE0006)
$EF_{projected\_fossil\_fuel}$	Emission factor for the fossil fuels projected to be used for substitution of non-renewable woody biomass by similar consumers	tCO <sub>2</sub> /TJ	81,6	81,6	81,6	81,6	81,6	81,6	Determined ex-ante (see CPA-DDs KE0002-KE0006)
$ER_i$	Emission reductions	tCO <sub>2</sub> /annum	2,703	2,703	2,703	2,703	2,703	2,703	Calculated
$BE_i$	Baseline emissions	tCO <sub>2</sub> /annum	3,793	3,793	3,793	3,793	3,793	3,793	Calculated
Leakage Emissions	Leakage emissions	tCO <sub>2</sub> /annum	0,190	0,190	0,190	0,190	0,190	0,190	Calculated
$PE_i$	Project emissions	tCO <sub>2</sub> /annum	0,900	0,900	0,900	0,900	0,900	0,900	Calculated
$ER_{cs}$	Emission reductions per ICS	tCO <sub>2</sub>	2,703	2,703	2,703	2,703	2,703	2,703	Calculated
$ER_{total}$	Emission reductions total (monitoring period)	tCO <sub>2</sub>	51,41	49,92	50,61	49,17	49,35	250,46	Calculated

## F.2. Calculation of project emissions or actual net removals

&gt;&gt;

As explained above, the methodology directly provides equation for emission reductions; without separate baseline, project or leakage emission reduction equations. Calculation of emission reductions has already been explained above as per the methodology. Thus, this section is not applicable.

## F.3. Calculation of leakage emissions

&gt;&gt;

As explained above, the methodology directly provides equation for emission reductions; without separate baseline, project or leakage emission reduction equations. Calculation of Emission Reductions has already been explained above as per the methodology by application of Gross to Net Leakage adjustment factor of 0.95 to baseline emissions. Thus, this section is not applicable.



**F.4. Calculation of emission reductions or net anthropogenic removals**

CPA UNFCCC reference number	Baseline GHG emissions or baseline net GHG removals (t CO <sub>2</sub> e)	Project GHG emissions or actual net GHG removals (t CO <sub>2</sub> e)	Leakage GHG emissions (t CO <sub>2</sub> e)	GHG emission reductions or net anthropogenic GHG removals (t CO <sub>2</sub> e)		
				Before 01/01/2013	From 01/01/2013	Total amount
9265-P1-0001-CP1	0	0	0	0	0	0
9265-P1-0002-CP1	51	0	0	0	51	51
9265-P1-0003-CP1	50	0	0	0	50	50
9265-P1-0004-CP1	51	0	0	0	51	51
9265-P1-0005-CP1	49	0	0	0	49	49
9265-P1-0006-CP1	49	0	0	0	49	49
<b>Total</b>	250	0	0	0	250	250

**F.5. Comparison of emission reductions or net anthropogenic removals achieved with estimates in the included CPA-DDs**

CPA UNFCCC reference number	Amount achieved during this monitoring period (t CO <sub>2</sub> e)	Amount estimated ex ante for this monitoring period in the CPA-DD (t CO <sub>2</sub> e)
9265-P1-0001-CP1	0	754
9265-P1-0002-CP1	51	805
9265-P1-0003-CP1	50	805
9265-P1-0004-CP1	51	805
9265-P1-0005-CP1	49	805
9265-P1-0006-CP1	49	805
<b>Total</b>	250	4,779

**F.5.1. Explanation of calculation of “amount estimated ex ante for this monitoring period in the CPA-DD”**

&gt;&gt;

For 9265-P1-0001-CP1:

The annual amount of 39,356 tCO<sub>2</sub>e was converted to the monitoring period of 7 days (39,356/365\*7 = 754).

CPAs 9265-P1-0002-CP1 to 9265-P1-0006-CP1:

The annual amount of 41,993 tCO<sub>2</sub>e (applicable to each of the 5 CPAs, namely CPAs 9265-P1-0002-CP1 to 9265-P1-0006-CP1) was converted to the monitoring period of 7 days (41,993/365\*7 = 4,779).

**F.6. Remarks on increase in achieved emission reductions**

&gt;&gt;

There is no increase in the GHG emission reductions achieved by the specific-case CPAs during this monitoring period.

**F.7. Remarks on scale of small-scale CPAs**

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There is no aggregated small-scale threshold for the CPAs. Since CPA consists solely of units that qualify as 'microscale CDM units'. For more details, see the registered CPA-DDs. Hence this section is not applicable.

## Document information

<i>Version</i>	<i>Date</i>	<i>Description</i>
03.0	31 May 2019	Revision to: <ul style="list-style-type: none"> <li>• Ensure consistency with version 02.0 of the “CDM project standard for programmes of activities” (CDM-EB93-A07-STAN);</li> <li>• Add a section on remarks on the observance of the scale limit of small-scale CPAs during the crediting periods;</li> <li>• Add "changes specific to afforestation or reforestation activities/CPA" as a possible post-registration changes;</li> <li>• Clarify the reporting of net anthropogenic GHG removals for A/R PoAs between two commitment periods;</li> <li>• Make structural and editorial improvements.</li> </ul>
02.0	7 June 2017	Revision to: <ul style="list-style-type: none"> <li>• Ensure consistency with version 01.0 of the “CDM project standard for programmes of activities (CDM-EB93-A07-STAN);</li> <li>• Make editorial improvements.</li> </ul>
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