

CDM-CPA-DD-FORM



**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- NI-003-Nigeria <u>7359-P1-0052-CP1</u>
Scale of the CPA	<input type="checkbox"/> Large-scale <input checked="" type="checkbox"/> Small-scale
Version number of the CPA-DD	Version <u>1008</u>
Completion date of the CPA-DD	<u>0205/0205/2021</u>
Title and UNFCCC reference number of the registered CDM PoA	PoA 7359: PoA for the reduction of emission from non-renewable fuel from cooking at household level.
Title and reference number of the corresponding generic CPA	Title: PoA for the Reduction of emission from non-renewable fuel from cooking at household level.
Coordinating/managing entity	Green Development AS
Host Party	Nigeria
Applied methodologies and standardized baselines	AMS I.E., Version 04, EB 60, title "Switch from non-renewable biomass for thermal application by the end user".
Sectoral scopes	Sectoral Scope: 01
Estimated amount of annual average GHG emission reductions	83,985 tCO ₂

SECTION A. Description of component project activity (CPA)

A.1. Purpose and general description of CPA

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Replace non-renewable fuel with renewable fuel for household cooking that voluntarily want to take part in the CPA project, through the lease or buying of an ethanol or biogas stove, household water purifying kit or buying water from community based water purification systems, from the project participant or from the project implementer. In total 12,000 households are expected to become project participants under the proposed CPA and each of these will have either;

- An ethanol stove or
- A Biogas stove And / or
- A household water purifying kit or
- Buy water from a community water purification system

A total of 12,000 households is expected to be included in the CPA, and the number of households to be included in the CPA is expected to increase gradually during the duration of the project.

The total number of appliances installed, may be higher than the total number of households to participate as combinations of stove and water purification system in one household will occur.

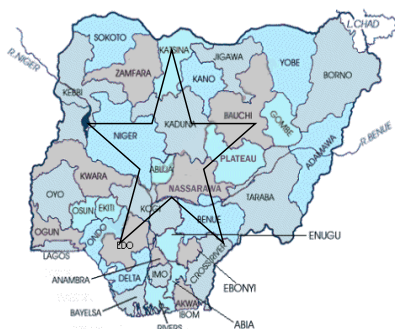
The total installed capacity will be under the project limitation of 45 MW as stated in the guidelines to the methodology¹.

The installation of the devices combined is expected to result in average CO₂ emission reductions of **88 05683.985** tCO₂ annually, resulting in a total emission reduction of **646 394 587.896** tCO₂ for the CPA during the first 7 years crediting period.

A.2. Location of CPA

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Parameters	Details
Name of area	Nigeria
Country	Nigeria
Latitude	9.0819
Longitude	8.6752
Country	Nigeria
CPA Implementer	Green Development AS



Marks the location of the CPA

¹ The installed capacity is calculated by multiplying the number of project participating households with the average thermal output from the deployed equipment in each household.

A.3. Technologies/measures

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The current practice, which is also the baseline scenario, is that households use non-renewable woody biomass for cooking. This practice is causing CO₂ emissions.

The CPA will reduce or eliminate the CO₂ emission from using non-renewable woody biomass for cooking. This will be achieved by providing the following solutions²:

1. Reduce the need for boiling water and hence the need for fuel for this process. This will be done by providing clean drinking water as an alternative to boiling water. Clean drinking water will be provided by two alternative solutions, depending on the project specific conditions³:

a) a)-Household water purification systems.

This will be a membrane-based system, to be installed at household level which will use no energy and which has been designed so that no unsafe drinking water will ever be available through the system. Such systems will be gravity based, and will hence require no external power consumption.

The water purification technology to be installed may consist of the following process

Pouring of water into a raw water container

Filtering of the water through a water purification filter

Collection of the purified water in a safe drinking water container

There is no monitoring equipment included in the system.

b) b)-Community based water purification system.

- i. Equipment to be installed and/or modified in order to provide drinking water from a community drinking water system will include boreholes with handpump and will include water filters. The handpump will be or will be based on the design of the India Mark-2 and 3 deep well handpump (Monopump) has a 50mm piston and 63.5 mm piston for a maximum water lift height of 50 meters and 30 meters respectively. The piston types are differentiated by the delivery rate, for the 50mm piston is 600 liters per hour while for the 63.5mm piston is 900 liters per hour, this however depends on well depth, the lift height and level of water.

ii. The types and levels of services

1. Type of service provided. Provide drinking water from a water well / ground water.
2. Level of service. The water shall meet national or WHO interim microbiological standards for drinking water (as specified in section B5.1).

² The CPAs might use different solutions with different capacity etc. as long as they still remain within the framework described in this document and comply with the methodology. The most cost-efficient solutions most suitable for the local conditions might be used as long as they still remain within the framework described in this document and comply with the methodology. These shall include the use of membrane-based systems for household water purification systems and community based water purification systems using filtering technology. Community based water purification systems may include the use of boreholes and handpumps.

³ The guidelines for filling out the CPA DD under section A.3 specify that "Do not provide information that is not essential to understanding the purpose of the CPA and how it reduces GHG emissions. Do not include information related to facilities, systems and equipment that are auxiliary to the main scope of the CPA and do not affect directly or indirectly GHG emissions and/or mass and energy balances of the processes related to the CPA." This is in direct contradiction to the requirements of details of the technology as specified in the Project Standard for Programmes of Activities, version 02, paragraph 159. CME cannot comply to both the paragraph 159 in the above mentioned project standard and in the guidelines to how to fill in the CPA DD form. CME has therefore decided to provide more information about the technology related to the water supply solutions than what is understood to be provided in accordance with the guidelines for filling out the CPA DD form. CME have, however, not provided the same level of information for the biogas stoves or the ethanol stoves as it is assumed the CDM EB has understood how these system contribute to Emission Reduction based on the technology description provided in accordance with the guidelines for filling out the CPA DD form only. This assumption is based on the fact that the CDM EB has approved issuance of CERs from CPAs as part of PoA 7359 on several occasions without requesting further information about the technology related to ethanol stoves or biogas stoves. No CDM EB members have ever raised any request for clarification about how the biogas stoves or the ethanol stoves contribute to reduction in emission, even though several individual CDM EB members has raised request for review related to other issues each of the first 6 times that a request for issuance has been submitted

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The operations of the pump do not depend on electricity or any other type of non-renewable fuel. The system operates independently from any other systems. The water is carried in buckets from the community water station to the house the project participating households

iii. The age and average lifetime of the equipment is in excess of 10 years. Monthly and tri-monthly checks combined with yearly replacements can extend the life of the pump. Such frequent checks and replacement of components is to be funded by the income from sales of Carbon Credits. Hence the life of the equipment will be negatively affected by delay in issuance of CERs. 10 years life of the system is based on CERs being issued within 5 months of request for issuance in which case the recommended checks and replacement of components can be followed.

iv. The energy and mass flows and balances of the facilities, systems and equipment. Water flow will be between 30 liter per minute and 13.3 liter per minute depending on the dept of the borehole. The system uses no external power other than human power.

v. There is no monitoring equipment included in the deployed systems.

Any pumps to be used in the process of purifying water will use renewable energy, so that there will be no emission from the operation of the water purification systems.

Both of these water purification solutions will provide clean safe drinking water that meet applicable national microbiological standards / Guidelines or WHO's interim performance target on household water treatment.

2. Replace non-renewable fuel with renewable fuel.

This will be done by providing energy efficient stoves that will use renewable fuel. Household might use biogas or denatured alcohol, based on the fuel that is locally available.

- a. Biogas stoves will be implemented as the first choice wherever biogas sources are available. The use of biogas sources will not only reduce the use of non-renewable fuel but also reduce the emission of methane into the atmosphere (the reduction of methane emission is however not included in the project. This is conservative.)
- b. Ethanol stoves will be implemented as the second choice wherever renewable denatured alcohol fuel is available.

A.4. Coordinating/managing entity

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Green Development AS

A.5. Parties and CPA implementers

Parties involved	CPA implementers	Indicate if the Party involved wishes to be considered as CPA implementer (Yes/No)
Party A (host Party) DNA of Nigeria	Green Development AS – Private Entity	No
Party B DNA of Norway	Green Development AS – Private Entity	No

A.6. Public funding of CPA

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No public funding has been provided to the CPA.

A.7. History of CPA

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Confirmation that:

- (a) The proposed CPA is neither registered as a CDM project activity nor included in another registered CDM PoA;
- (b) The proposed CPA is not a project activity that has been deregistered.

Declaration that:

- (c) The proposed CPA is not a CPA that has been excluded from a registered CDM PoA;
- (d) The CPA is not part of a CDM PoA whose crediting period expired. No other CPAs for the same solutions has expired in the same geographical location as the proposed CPA.

A.8. Debundling

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In the CDM-EB 54 meeting report annex 13, "GUIDELINES ON ASSESSMENT OF DEBUNDLING FOR SSC PROJECT ACTIVITIES (Version 03.1)". Para 7 stipulates the following:

"If each of the independent subsystems/measures (e.g., biogas digesters, residential solar energy systems, kerosene or incandescent lighting replacements) included in one or more CDM project activities is no greater than 1% of the small scale thresholds defined by the applied methodology and the subsystems/measures are indicated in the PDDs to be each implemented at or in multiple locations (e.g., installed at or in multiple homes) then these CDM project activities are exempted from performing a de-bundling check, i.e., considered as being not a de-bundled component of a large scale activity."

As per de-bundling criteria, 1% of the small-scale threshold is 450 kW. As none of the components in the project will have a thermal capacity of more than 450 kW, each independent subsystem is below the threshold outlined.

Hence the project is considered as being not a de-bundled component of a small-scale activity.

SECTION B. Application of methodologies and standardized baselines**B.1. References to methodologies and standardized baselines**

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AMS I.E is applicable for the following reasons:

- The programme activity involves displacing the use of non-renewable biomass by introducing renewable energy technology.
- The project participants have been using non-renewable biomass since before 31/12/1989.
 - a. Confirmed by baseline survey. See eligibility criteria.
 - b. Default values for portion of woody biomass that is considered non-renewable. See CDM – SSC EB thirty-fifth meeting report, annex 20.
http://cdm.unfccc.int/Panels/ssc_wg/meetings/035/ssc_035_an20.pdf
 - a. The CPA is small scale as the thermal capacity of all the solutions installed in a CPA is less than 45 MW.
 - a) The installed thermal capacity is calculated within the spread sheet used to calculate emission reductions. If the installed thermal capacity in the CPA exceeds 45 MW the emission reductions shall be capped to the emission reduction achieved from households that has a total installed thermal capacity of 45 MW from the equipment deployed by the project.
 - b. The methodology is approved for application to CPAs under PoAs

No standardized baseline is applicable for this CPA

The methodology AMS I.E version 04 refer to the following methodological tools.

- General guidelines to SSC CDM methodologies
- General guidelines for sampling and surveys for small-scale CDM project activities

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

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The proposed CDM project will adapt ethanol and biogas stoves and use denatured alcohol or biogas as fuel for cooking at participating household, replacing the combustion of non-renewable woody biomass that is used as fuel for cooking in the baseline. The proposed CDM project will also adapt water purification at a household or community level, reducing the need to cook for the purpose of sterilizing the water, thus replacing the combustion of non-renewable woody biomass that is used as fuel for cooking in the baseline. Only CO₂ emission from burning the non-renewable woody biomass is included in calculating the project GHG emission reductions. In case of community water systems the auxiliary load shall be fuelled by renewable energy and hence no emission. Emission sources and gasses included in the project boundary are listed in the table below;

Table. Emission Sources within CPA boundary that are considered

	Source	GHG	Included?	Justification/Explanation
Baseline	Emission from combusting non-renewable woody biomass	CO ₂	Included	Main emission source.
		CH ₄	Excluded	Excluded for simplification. The emission source is assumed to be very small.
		N ₂ O	Excluded	Excluded for simplification. The emission source is assumed to be very small.
Project activity	Emission from combustion of renewable fuel	CO ₂	Excluded	No net CO ₂ emission from renewable fuel.
		CH ₄	Excluded	Excluded for simplification. The emission source is assumed to be very small.
		N ₂ O	Excluded	Excluded for simplification. The emission source is assumed to be very small.
	Possible increase in use of non-renewable woody biomass from non project participants	CO ₂	Included	A standard adjustment factor of 0.95 has been used in accordance with AMS I.E.
		CH ₄	Excluded	Excluded for simplification. The emission source is assumed to be very small.
		N ₂ O	Excluded	Excluded for simplification. The emission source is assumed to be very small.

According to the methodology, leakage shall be considered if the equipment currently being utilized is transferred from outside the boundary to the project boundary. As no equipment currently being utilized is to be transferred to the project boundary, no such leakage applies.

B.3. Establishment and description of baseline scenario

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The baseline scenario is the same as the current practice, in accordance with the baseline study. The baseline scenario is that households use non-renewable woody biomass for cooking.

The baseline scenario is identified based on the following sources;

- a) Baseline survey
 - η_{old} – Efficiency of the stoves used in the baseline scenario. The baseline survey will UNFCCC/CNUECC CDM – Executive Board Page 8 determine the portion of stoves that is considered efficient and the portion of baseline stoves that is considered inefficient in accordance with the methodology.
 - C_p – Fraction of woody biomass that is used in the form of charcoal in the project area.
- b) End user contract
 - Confirm that water is being boiled in the baseline scenario.

- c) Default values from the methodology
 - $EF_{\text{projected_fossilfuel}}$
 - NCV_{biomass}
 - LF
- d) IPCC default values
 - $NCV_{\text{denatured alcohol}}$
 - NCV_{biogas}
 - NCV_{Charcoal}
- e) Independent 3rd party reports
 - $f_{\text{NRB},y}$ Default value provided by UNFCCC
 - WB_{LB}
 - $WB_{LB\text{Charcoal}}$
 - CCF

B.4. Estimation of emission reductions

B.4.1. Explanation of methodological choices

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The methodology AMS-I.E version 04, requires methodological choices to be made: The SSC-CPA used the following choices;

Determination of B_y (Quantity of woody biomass that is substituted or displaced in tonnes)

B_y is determined by using one of the following options:

- a) Calculated as the product of the number of appliances multiplied by the estimate of average annual consumption of woody biomass per appliance (tonnes/year); This can be derived from historical data or estimated using survey methods; or
- b) Calculated from the thermal energy generated in the project activity as:

$$B_y = HG_{p,y} / (NCV_{\text{biomass}} \cdot \eta_{\text{old}})$$

Option b) will be used by the SSC-CPA.

Determination of η_{old} (Efficiency of systems being replaced).

η_{old} is determined by using one of the following options:

- a) Measured using representative sampling methods or based on referenced literature values as weighted average values if more than one type of systems is replaced, or;
- b) Use a default value of 0.10 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 might be optionally used.

Option b, is used.

Calculation of leakage

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 their woody biomass is sourced. The following potential source of leakage shall be considered:

"The use / diversion of non-renewable woody biomass saved under the project activity by non-project households/users that previously used renewable energy sources. If this leakage assessment quantifies an increase in the use of non-renewable woody biomass used by the non-project households/users, that is attributable to the project activity, then B_y is adjusted to account for the quantified leakage. Alternatively, B_y is multiplied by a net to gross adjustment factor of 0.95 to account for leakages, in which case surveys are not required."

The alternative provided by the methodology to multiply B_y with a net to gross adjustment factor of 0.95 to account for leakage will be used by the SSC-CPA.

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According to the methodology, leakage shall be considered if the equipment currently being utilized is transferred from outside the boundary to the project boundary. As no equipment currently being utilized is to be transferred to the project boundary, no such leakage applies.

B.4.2. Data and parameters fixed ex ante

(Copy this table for each piece of data or parameter.)

Data/Parameter	$f_{NRB,y}$				
Data unit	Fraction				
Description	Fraction of biomass used in the absence of the project activity in year y, that can be established as non-renewable biomass				
Source of data	http://cdm.unfccc.int/Panels/ssc_wg/meetings/037/ssc_37_an14.pdf (CDM SSC WG- Thirty-seventh meeting Report Annex 14)				
Value(s) applied	0.93				
Choice of data or measurement methods and procedures	Parameter	Description	Equation	Value	Data source
	fNRB (%)	Fraction of non renewable biomass	$NRB/(NRB+DRB)$	93	CDM SSC WG
<p>Methodology of calculation (Default values of fraction of non-renewable biomass for Parties with 10 or less registered CDM project activities as of 31 December 2010, appendix 1)</p> <p>$fNRB = NRB / (NRB + DRB)$</p> <p>Where $NRB = 114\,430\,888$ $DRB = 8\,615\,906$ $fNRB = 114\,430\,888 / (114\,430\,888 + 8\,615\,906)$ $fNRB = 0.9299 = 0.93$ or 93%</p> <p>(CDM SSC WG- Thirty-seventh meeting Report Annex 14)</p>					
Purpose of data	Calculation of baseline emissions.				
Additional comment	Not applicable.				

Data / Parameter	$EF_{projected_fossilfuel}$
Unit	tCO ₂ /TJ
Description	Emission factor for the substitution of non-renewable biomass that is substituted.
Source of data	Default value in methodology.
Value(s) applied	81.6
Choice of data or Measurement methods and procedures	Not applicable.
Purpose of data	Calculation of baseline emissions.
Additional comment	Not applicable.

Data / Parameter	$NCV_{biomass}$
Unit	TJ/tonne
Description	Net Calorific Value of the non-renewable biomass that is substituted.

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Source of data	Default value in methodology.
Value(s) applied	0.015
Choice of data or Measurement methods and procedures	Not applicable.
Purpose of data	Calculation of baseline emissions.
Additional comment	Not applicable.

Data / Parameter	NCVdenatured alcohol
Unit	TJ / m ³
Description	Energy Content of denatured alcohol.
Source of data	2006 IPCC Guidelines for National Greenhouse Gas inventories combined with default density of ethanol.
Value(s) applied	0.0213 TJ / m ³
Choice of data or Measurement methods and procedures	<p>NCV value of ethanol is 27.0 TJ/Gg according to 2006 IPCC Guidelines for National Greenhouse Gas inventories. Volume 2 – Energy, Chapter 1 – Introduction, Table 1.2 “Default Net Calorific Values (NCVs)”.</p> <p>Density of ethanol is 0.789 g/cm³at 20 °C http://en.wikipedia.org/wiki/Ethanol NCV for ethanol is hence calculated as $(27.0 * 0.789 / 1000) = 0.0213 \text{ TJ / m}^3$</p> <p>Denatured alcohol will consist of a mix of ethanol and other types of alcohol or toxins or bittering agents. Ethanol or methanol shall always be the predominant type of fuel in the denatured alcohol mix that will be used by the project.</p>
Purpose of data	Calculation of baseline emissions.
Additional comment	Ethanol is the same as bio gasoline. See 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 2 Energy, Chapter 1 Introduction, Table 1.1 – Definitions of fuel types used in the 2006 IPCC guidelines.

Data / Parameter	NCV _{biogas}
Unit	TJ/m ³
Description	Energy content of the biogas.
Source of data	IPCC default value.
Value(s) applied	0.000 0 215
Choice of data or Measurement methods and procedures	<p>Default energy value of biogas is used in other methodologies. AMS-I.I</p> <p>“Biogas/biomass thermal application for households/small users” version 042. The default value is described as:</p> <p>“Net calorific value of the biomass (GJ/unit mass or volume, dry basis). For biogas, use default value: 0.0215 GJ/m³ biogas (assuming NCV of the methane: 0.0359 GJ/m³, default methane content in biogas: 60%)”</p> <p>0.0215 GJ/m³ equals 0.0000215 TJ/m³ http://cdm.unfccc.int/methodologies/SSCmethodologies/approved</p>
Purpose of data	Calculation of baseline emissions.
Additional comment	Not applicable.

Data / Parameter	NCVCharcoal
Unit	TJ/Tonne

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Description	Energy content of Charcoal.
Source of data	IPCC default value.
Value(s) applied	0.0295
Choice of data or Measurement methods and procedures	Default value from Table 1.2 in the 2006 IPCC Guidelines for National Greenhouse gas Inventory, Volume 2 Energy. http://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/2_Volume2/V2_1_Ch1_Introduction.pdf The value is given as 29.5 TJ/Gg. This equal to 0.0295 TJ/Tonne.
Purpose of data	Calculation of baseline emissions.
Additional comment	Not applicable.

Field Code Changed

Data / Parameter	η_{old}
Unit	Fraction.
Description	Efficiency of system being replaced.
Source of data	Baseline survey.
Value(s) applied	0.1074
Choice of data or Measurement methods and procedures	Used the weighted average of the default values of 0.1 and 0.2 according to the definition in the methodology. Most of the households in the baseline survey used traditional stoves without chimney.
Purpose of data	Calculation of baseline emissions.
Additional comment	Average value was hence determined as $((0.1 * (1-0)) + (0.2 * 0)) = 0.1074$

Data / Parameter	WB _{LB}
Unit	Kg/litre
Description	Mass of woody biomass that would have been required to boil one litre of water.
Source of data	Laboratory test.
Value(s) applied	0.4356
Choice of data or Measurement methods and procedures	WBT REPORT on 25/02/2013 P.8 Following the formula 0.4356 kg of Wood is needed for each litre of water that has been boiled.
Purpose of data	Calculation of baseline emissions.
Additional comment	Not applicable.

Data / Parameter	WB _{LB,Charcoal}
Unit	Kg/litre
Description	Mass of woody biomass that would have been required to boil one litre of water.
Source of data	Laboratory test.
Value(s) applied	0.2041
Choice of data or Measurement methods and procedures	WBT REPORT, 25/02/2013 P.9 0.2041 kg of Charcoal is needed for each litre of water that has been boiled
Purpose of data	Calculation of baseline emissions.
Additional comment	Not applicable.

Data / Parameter	C _{CF}
Unit	Number
Description	Charcoal conversion factor.

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Source of data	Protecting and restoring forest carbon in tropical Africa <i>Chapter 6: Woodfuels and forests in tropical Africa</i>
Value(s) applied	10.0
Choice of data or Measurement methods and procedures	10 kg of wood is used to produce 1 kg of charcoal, manufactured with traditional kilns. Reference: Protecting and restoring forest carbon in tropical Africa <i>Chapter 6: Woodfuels and forests in tropical Africa</i> Format PDF/ p.10
Purpose of data	Calculation of baseline emissions.
Additional comment	Not applicable.

Field Code Changed

Data / Parameter	C _P
Unit	Fraction.
Description	Portion of woody biomass that is used in the form of Charcoal in the project area.
Source of data	Baseline survey.
Value(s) applied	0.6667
Choice of data or Measurement methods and procedures	Not applicable.
Purpose of data	Calculation of baseline emissions
Additional comment	Not applicable.

Data / Parameter	LF
Unit	Fraction
Description	Net to gross adjustment factor of 0.95 to account for leakage.
Source of data	Default value in methodology.
Value(s) applied	0.95
Choice of data or Measurement methods and procedures	Not applicable.
Purpose of data	Calculation of leakage.
Additional comment	Not applicable.

Data / Parameter	Thermal output of water purification systems
Unit	kW
Description	Thermal energy output from water purification system.
Source of data	Community water purification system product description.
Value(s) applied	0.5
Choice of data or Measurement methods and procedures	The value of 0.5 kW is based on the thermal output of the equipment used to boil the water, e.g. a default value for the baseline stoves.
Purpose of data	Calculation of baseline emissions.
Additional comment	<u>This has no impact on emission reduction, and it has marginal impact on the number of systems that can be included in the program.</u> <u>We have used a fixed value of 0.5 kW capacity per user. This represents the maximal thermal output that a stove has in the baseline. It should be clarified that the methodology defines the stoves in the</u>

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	<p><u>baseline as having a thermal efficiency of 0.1 or 0.2, which equals to 10% or 20%. A stove with 20% thermal efficiency will not have a thermal capacity of less than 0.5 kW, and a stove with thermal efficiency of 10% will have a thermal capacity of half this, e.g. less than 0.25 kW.</u></p> <p><u>Using a value of 0.5 kW per household that use purified water is hence conservative. It could be argued that gravity-based systems do not use energy. Based on such logic we would have 0 kW energy output for household water purification systems that use gravity-based water purification systems. If we did use 0 kW energy output per system we could have a CPA that covers all of Africa and include 10 million households that were provided with purified water from the CPA. This would be within the small-scale definition of the methodology. We do however believe that such an approach would not be in line with the intention of having limited scope of small-scale project activities. Hence we use the value of 0.5 kW which is a conservative value. The same value is used for community-based water purification systems. The thermal output of the community-based water purification system referred to in Section D.5 under eligibility criteria 3, has an energy output of 1 kW and has capacity to produce 1000 gallon a day. This is enough to provide drinking water for 100 households, which gives an energy output per household of 0.01 kW.</u></p> <p><u>To be conservative the value for thermal output of water purification systems has been set at 0.5 kW. This value is the same as the value for parameter provided in the registered PoA-DD</u></p>
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B.4.3. Ex ante calculation of emission reductions

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Emission reductions have been determined as:

$$ER_y = ER_{y, \text{ Denatured alcohol}} + ER_{y, \text{ Biogas}} + ER_{y, \text{ Water}}$$

Where

$$ER_{y, \text{ Denatured alcohol}} = B_{y, \text{ Denatured alcohol}} * f_{NRB,y} * NCV_{biomass} * EF_{projected_fossilfuel}$$

$$ER_{y, \text{ Biogas}} = B_{y, \text{ Biogas}} * f_{NRB,y} * NCV_{biomass} * EF_{projected_fossilfuel}$$

$$ER_{y, \text{ Water}} = B_{y, \text{ Water}} * f_{NRB,y} * NCV_{biomass} * EF_{projected_fossilfuel}$$

$$ER_y = \text{Emission reductions during the year } y, \text{ in tCO}_2\text{e}$$

$$B_y = \text{Quantity of biomass that is substituted or displaced in tonnes}$$

$$f_{NRB,y} = \text{Fraction of biomass used in the absence of the project activity in year } y, \text{ that can be established as non-renewable biomass.}$$

$$NCV_{biomass} = \text{Net calorific value of the non-renewable woody biomass that is substituted (IPCC default for wood fuel, 0.015 TJ/tonnes)}$$

$$EF_{projected_fossilfuel} = \text{Emission factor for the substitution on non-renewable biomass by similar consumers. Use a default value of 81.6 tCO}_2\text{/TJ}$$

Step 1: B_y was determined:

B_y is determined separately for the stoves (denatured alcohol and biogas) and for the purified water consumed (drinking water from household water purification systems plus the water from the community water systems).

Hence B_y is the sum of $B_{y, \text{ biogas}} + B_{y, \text{ Denatured alcohol}} + B_{y, \text{ Water}}$;

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$$B_{y, \text{Biogas}} = \left(\frac{((H_{Gp,y, \text{Biogas}} / (NCV_{\text{biomass}} * \eta_{\text{old}})) * (1 - C_P)) + ((H_{Gp,y, \text{Biogas}} / (NCV_{\text{Charcoal}} * \eta_{\text{old}})) * (C_P * C_{CF}))}{LF} \right)$$

$$B_{y, \text{Denatured alcohol}} = \left(\frac{((H_{Gp,y, \text{Denatured alcohol}} / (NCV_{\text{Biomass}} * \eta_{\text{old}})) * (1 - C_P)) + ((H_{Gp,y, \text{Denatured alcohol}} / (NCV_{\text{Charcoal}} * \eta_{\text{old}})) * (C_P * C_{CF}))}{LF} \right)$$

$$B_{y, \text{Water}} = \left(\frac{((N_{p,y} * QDW_{p,y} * W_{LB} * 365 * 10^{-3}) * (1 - C_P)) + ((N_{p,y} * QDW_{p,y} * W_{LB, \text{Charcoal}} * 365 * 10^{-3}) * (C_P * C_{CF}))}{LF * W_{\text{quality}, y}} \right)$$

Where

$B_{y, \text{Biogas}}$	=	Quantity of woody biomass that is substituted or displaced in ton as a result of the biogas used by the project in year y.
$H_{Gp,y, \text{Biogas}}$	=	Quantity of thermal energy generated by the biogas used the project participating households in year y measured in TJ.
NCV_{Biomass}	=	Net Calorific Value of the non-renewable woody biomass that is substituted.
NCV_{charcoal}	=	Net Calorific Value of Charcoal.
η_{old}	=	Efficiency of the old stoves that has been replaced by the project.
$B_{y, \text{Denatured alcohol}}$	=	Quantity of woody biomass that is substituted or displaced in ton as a result of the denatured alcohol used by the project in year y.
$H_{Gp,y, \text{Denatured alcohol}}$	=	Quantity of thermal energy generated by the denatured alcohol used by the project participating households in year y, measured in TJ.
$B_{y, \text{Water}}$	=	Quantity of woody biomass that is displaced in ton as a result of the purified water replacing the need to boil water.
$N_{p,y}$	=	Total number of people in the project area that get purified water as a result of the project activity.
$QDW_{p,y}$	=	Volume of drinking water in litres per person per day.
W_{LB}	=	Mass of woody biomass that would have been required to boil one litre of water (kg/litre).
$W_{LB, \text{Charcoal}}$	=	Mass of woody biomass in the form of charcoal that would have been required to boil one litre of water (kg/litre).
C_{CF}	=	Charcoal Conversion Factor.
C_P	=	Portion of woody biomass that is used in the form of charcoal in the project area.
LF	=	Net to gross adjustment factor of 0.95 to account for leakage.
$W_{\text{quality}, y}$	=	Portion of purified water meet national standards for drinking water in year y.

Step 2: $N_{p,y}$ is determined

$N_{p,y}$	=	Total number of people that get purified water as a result of the project activity. This value will be monitored.
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Step 3. QDW_{py} is determined from annual-monitoring survey.

Step 4. $H_{Gp,y}$ is determined.

$H_{Gp,y}$ calculations;

$H_{Gp,y, \text{Biogas}}$	=	$NCV_{\text{Biogas}} * BG_{\text{Usage}, y} * BG_{\text{Stoves, Units}, y} * (BG_{\text{stove, efficiency}} / 100) * 365$
$H_{Gp,y, \text{denatured alcohol}}$	=	$NCV_{\text{Denatured alcohol}} * ET_{\text{Usage}, y} / 1000 * ET_{\text{Stoves, Units}, y} * (ET_{\text{stove, efficiency}} / 100) * 365$

Where

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HG _{p,y}	=	Quantity of thermal energy generated by the new renewable energy technology in the project area in year y (TJ).
NCV _{Biogas}	=	Net Calorific Value of Biogas. Based on default value.
BG _{Usage,y}	=	Average Biogas usage in m ³ per day per in year y (multiplied by 365 to get annual consumption per user).
BG _{Stoves, Units,y}	=	Biogas stoves in use in the project area in year y.
NCV _{Denatured alcohol}	=	Net Calorific Value of Ethanol. Based on default value.
ET _{Usage,y}	=	Average denatured alcohol usage per litre per households in year y. Divided by 1000 to get value in m ³ .
ET _{Stoves, Units,y}	=	Ethanol stoves in use in the project area in year y.

Step 5. η_{old} is determined by:

η_{old} = Thermal efficiency of stoves being replaced.

η_{old} was determined from data from the baseline survey conducted prior to project implementation.

Step 6. $f_{NRB, y}$ was determined by:

Was determined based on default values.

Step 7. Determine the average emission reduction from project participating households.

Average emission reduction will be calculated based on the project participating households, selected for ~~annual~~-monitoring survey. The number of project participating households to be monitored shall be large enough to ensure that the 90/10 or 95/10 confidence level is obtained. Total emission reduction from the households that has been monitored, shall be divided by the number of household that has been monitored in order to determine the average emission reduction per project participating household.

Step 8. Determine total CPA emission reduction.

Total ex-ante emission reduction from CPA was determined by multiplying the average expected emission reduction per project participating household with the total expected number of project participating households at the time of the request for verification. For the ex-ante calculations the number of project participating households in each year was estimated.

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

Year	Baseline emissions (t CO ₂ e)	Project emissions (t CO ₂ e)	Leakage (t CO ₂ e)	Emission reductions (t CO ₂ e)
Year 2014	47,411	0	0	47,411
Year 2015	66,375	0	0	66,375
Year 2016	75,858	0	0	75,858
Year 2017	85,340	0	0	85,340
Year 2018	94,822	0	0	94,822
Year 2019	104,304	0	0	104,304
Year 2020	113,786	0	0	113,786
Total	587,896			587,896
Total number of crediting years				7

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Annual average over the crediting period	83 985	0	0	83 985
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Default leakage factor of 0.95

B.5. Monitoring plan

B.5.1. Data and parameters to be monitored

Data / Parameter	ET _{stoves, units,y}
Unit	Number
Description	Average number of ethanol stoves used by project participating households in year y.
Source of data	Monitoring of random sample of project participating households.
Value(s) applied	0.4559
Measurement methods and procedures	Monitoring of randomly selected project participating households. The sample size shall be sufficient to obtain the required 90/10 confidence level or 95/10 confidence level if a group of CPAs are included in the same monitoring process in accordance with EB 74 annex 6.
Monitoring frequency	At least every two years. Annually.
QA/QC procedures	The number of households that use ethanol stoves in the project area will be cross checked with the sales records from the ethanol stove suppliers,
Purpose of data	Calculations of baseline emissions.
Additional comments	A project participating households will normally have no ethanol stove or they will have 1 ethanol stove. The average will hence be a value between 0 and 1 ethanol stove per household.

Data / Parameter	ET _{usage,y}
Unit	Litres
Description	Average daily denatured alcohol usage by project participating households in year y.
Source of data	Monitoring of random sample of project participating households. The sample size shall be sufficient to obtain the required 90/10 confidence level or 95/10 confidence level if several CPAs are included in the same monitoring process.
Value(s) applied	0.3191
Measurement methods and procedures	The usage of denatured alcohol will be physically recorded in a representative number of households over a period of 7 days. This will be used to calculate the average daily denatured alcohol consumption per household that use ethanol stoves.
Monitoring frequency	At least every two years. Annually.
QA/QC procedures	The denatured alcohol consumption will be based on pure ethanol. Hence the denatured alcohol used by the household will be measured to determine its purity. If the NCV of the denatured alcohol is below that of the default NCV _{denaturedAlcohol} 0.013 TJ/m ³ then the ET usage shall be adjusted for the lower NCV of the denatured alcohol used. If the NCV of the denatured alcohol uses is 10% lower than the default value for NCV _{denatured Alcohol} then the ET _{usage,y} shall be reduced by 10% relative to the measured volume of denatured alcohol used.
Purpose of data	The purity of the denatured alcohol will be measured and registered by the representative sample of households monitored for ET _{usage,y} . Calculations of baseline emissions.

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Additional comments	The purity or strength of the denatured alcohol will be measured at every household which are monitored for $ET_{usage,y}$. This value will then be multiplied with the volume of denatured alcohol used in order to determine the equivalent of denatured alcohol with 100% purity. Example. A household use 5 litre of denatured alcohol with 90% purity, then the calculation will be $5 * 90\% = 4.5$ liter of denatured alcohol with 100% purity.
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Data / Parameter	$ET_{stove, Capacity,y}$
Unit	kW
Description	Average thermal capacity of ethanol stove used by the project participating households.
Source of data	Monitoring of random sample of project participating households.
Value(s) applied	0.7279
Measurement methods and procedures	Product description for each ethanol stove shall be used to determine its thermal capacity when this is available from stove suppliers. Alternatively, the thermal capacity of the stoves may be determined by a qualified laboratory.
Monitoring frequency	At least every two years. Annually.
QA/QC procedures	Not applicable
Purpose of data	Calculation of baseline emissions.
Additional comments	Not applicable.

Data / Parameter	$ET_{stove, Efficiency,y}$
Unit	Percentage
Description	Average thermal efficiency of ethanol stove used by the project participating household.
Source of data	Monitoring of random sample of project participating households.
Value(s) applied	27.3529
Measurement methods and procedures	Product description for each ethanol stove shall be used to determine its thermal efficiency when this is available from stove suppliers. Alternatively, the thermal efficiency shall be determined by a qualified laboratory.
Monitoring frequency	At least every two years. Annually.
QA/QC procedures	Not applicable
Purpose of data	Calculation of baseline emissions.
Additional comments	Not applicable.

Data / Parameter	$BG_{Stoves, units,y}$
Unit	Number
Description	Average number of biogas stoves used by project participating household in year y.
Source of data	Monitoring of random sample of project participating households.
Value(s) applied	0.1029
Measurement methods and procedures	Monitoring of randomly selected project participating households. The sample size shall be sufficient to obtain the required 90/10 confidence level or 95/10 if several CPAs are part of the same monitoring process.
Monitoring frequency	At least every two years. Annually.
QA/QC procedures	The number of biogas users in the project area will be crosschecked with the sales records from the biogas stove suppliers
Purpose of data	Calculation of baseline emission.
Additional comments	Not applicable.

Data / Parameter	$BG_{usage,y}$
Unit	m^3

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Description	Average daily biogas usage per project participating household in year y
Source of data	Monitoring of random sample of project participating households.
Value(s) applied	0.0110
Measurement methods and procedures	Monitoring from a random sample of project participants. Biogas meters will be installed for a period of one week at participating households targeted for monitoring. This will be used to calculate the average daily biogas usage per biogas user. The sample size shall be sufficient to obtain the required 90/10 confidence level, or 95/10 confidence level if several CPAs are included in the same monitoring process.
Monitoring frequency	At least every two years. Annually.
QA/QC procedures	Biogas meters will be calibrated at least every two years. annually.
Purpose of data	Calculation of baseline emissions.
Additional comments	The biogas value is very low due to the risk associated with the biogas production.

Data / Parameter	BG _{stove, Capacity, y}
Unit	kW
Description	Average thermal capacity of biogas stove used by the project participating households
Source of data	Monitoring of random sample of project participating households.
Value(s) applied	0.2882
Measurement methods and procedures	Product description for each biogas stove shall be used to determine its thermal capacity when this is available from stove suppliers. Alternatively, the thermal capacity of the stoves may be determined by a qualified laboratory. The product description with a confirmation that the product has been approved for program inclusion shall be available at the time of monitoring. The sample size shall be sufficient to obtain the required 90/10 confidence level or 95/10 if several CPAs are part of the same monitoring process.
Monitoring frequency	At least every two years. Annually.
QA/QC procedures	Not applicable.
Purpose of data	Calculation of baseline emissions.
Additional comments	Not applicable.

Data / Parameter	BG _{stove, Efficiency, y}
Unit	Percentage
Description	Average thermal efficiency of biogas stove used by the project participating households.
Source of data	Monitoring of random sample of project participating households.
Value(s) applied	5.8676
Measurement methods and procedures	Product description for each biogas stove shall be used to determine its thermal efficiency when this is available from stove suppliers. Alternatively, the stove efficiency shall be determined by a qualified laboratory. The sample size shall be sufficient to obtain the required 90/10 confidence level or 95/10 if several CPAs are part of the same monitoring process.
Monitoring frequency	At least every two years. Annually.
QA/QC procedures	Not applicable.
Purpose of data	Calculation of baseline emissions.
Additional comments	Not applicable.

Data / Parameter	N _{p, y}
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Unit	Number
Description	Average number of people in project participating households drinking purified water provided by the equipment supplied by the program.
Source of data	Monitoring of random sample of project participating households.
Value(s) applied	2.0588
Measurement methods and procedures	Monitoring of randomly selected project participating household. This will be done according the monitoring process. The sample size shall be sufficient to obtain the required 90/10 confidence level or 95/10 if several CPAs are part of the same monitoring process.
Monitoring frequency	At least every two years. Annually.
QA/QC procedures	Not applicable
Purpose of data	Calculation of baseline emissions.
Additional comments	The value applied refers to the average value per household and is low because only a limited number of project participating households in the project will get access to purified water through the project.

Data / Parameter	QDW _{p,y}
Unit	Litre/Day
Description	Average nr of litre of purified water used by each person in project participating households in year y.
Source of data	Monitoring of random sample of project participating households. The sample size shall be sufficient to obtain the required 90/10 confidence level or 95/10 if several CPAs are part of the same monitoring process.
Value(s) applied	1.9559
Measurement methods and procedures	Monitoring of random sample of project participating household. This will be done according to the monitoring process as described in the Program Management Manual. The households will be monitored for one week, to determine the total consumption of purified water by the household, and this value will be divided by the number of people in the household and by 7 in order to get the average daily consumption of purified water per person. In case of a community based water purification system is being used, a single end user contract might be signed for the whole community which get access to the purified water. Such a contract must state how many households that are included in the community, and then the annual monitoring survey might optionally monitor the daily distribution of the purified water from the community based water purification facility and divided this with the total number of number of people registered as receiving purified water from the community based water purification plant.
Monitoring frequency	At least every two years. Annually.
QA/QC procedures	The value will be capped at 5.5, in accordance with the methodology.
Purpose of data	Calculation of baseline emissions.
Additional comments	The number of samples will be according to the required samples as calculated in table of expected values to be determine the required sample size, under section 7.2.

Data / Parameter	W _{Quality,y}
Unit	Yes or No
Description	Water Quality – to conform that purified water meet national or WHO interim microbiological standards for drinking water in year y.
Source of data	Laboratory test or portable water quality test kits.
Value(s) applied	1.0
Measurement methods and procedures	Yes will be registered as 1.0 No will be registered as 0
Monitoring frequency	At least every two years. Annually.

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QA/QC procedures	To ensure compliance of the microbiological water quality either with: <ul style="list-style-type: none"> • The community microbiological water purification systems shall provide purified water that meet applicable national microbiological standards/guidelines or WHO's interim performance targets on households water treatment, and have energy output of less than 50 kW. • The Household microbiological water purification systems shall provide purified water that meet applicable national microbiological standards/guidelines or WHO's interim performance target on household water treatment.
Purpose of data	Calculation of baseline emissions.
Additional comments	WHO classifies a contamination of up to 100 E. coli CFU/ per 100 ml as intermediate risk. An E. coli CFU in 10mlcount of less than 100 per100 ml can therefore be used as an indication that the drinking water is safe. See: Table 5.2 on page 78 of "Guidelines for drinking-water quality", second edition, Volume 3 "Surveillance and control of community supplies".

B.5.2. Sampling plan

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Sampling shall be done randomly.

B.5.3. Other elements of monitoring plan

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Monitoring will be at least once every two years and will consist of the following activities

1. Select a time for monitoring.
2. Quantifying the number of participating project participating households that shall be subject to monitoring.
3. Identifying the households to be subject to monitoring according to a sampling plan.
4. Ensure that equipment is calibrated.
5. Sending pre trained staff to the selected households to conduct the monitoring.
6. The monitoring results are sent to the CME "Recording and Data Department" where the data will be put into a data base and emission reductions will be calculated.

The data collected as part of the annual-monitoring survey will be kept for the duration of the program plus two years and will be stored by the Recording and Data Department.

The monitoring of the households selected for monitoring will provide data to quantify the average emission reduction achieved by each participating household.

The average emission reduction achieved from participating households in a period will be multiplied with the total number of project participating households within the CPA at the time of the verification, to determine the total emission reduction achieved in the CPA.

The monitoring plan will also include identification of suppliers of denatured alcohol, biogas and purified water to the project participating household. Potential emission from the supply of biogas and denatured alcohol shall be identified and quantified. If emission from the supply of biogas and denatured alcohol is causing emission that is less than 10% of the project emission reductions, such emission is considered negligible according to the "General guidance on leakage in biomass project", EB 47, Annex 28, paragraph 4.

If emission from the supply of the biogas and denatured ethanol is not negligible, then such emissions emission shall be accounted for. Then suppliers of biogas or denatured alcohol or the project participants that receive the fuel from suppliers which contribute to considerable emission from the supply of biogas and denatured alcohol shall be excluded from the project, so that the project meet the requirement of having insignificant emission from the biogas and denatured alcohol supply. A report related to emission from the

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supply of biogas and denatured alcohol to the households subject to monitoring shall be enclosed with the ~~annual~~ monitoring report. This report shall include a list of all the identified suppliers of denatured alcohol that supply denatured alcohol to the households that has been monitored. An analysis shall determine from which of these suppliers the production of the denatured alcohol is significant or not significant.

Area including in the monitoring process:

The monitoring can be done for a single CPA, or a group of CPAs. The project participant could decide to do the monitoring on groups of CPAs to reduce the total cost of monitoring. The group of CPAs could include all the CPAs included in the Program of Activities.

Monitoring plan.

The monitoring plan sets out to quantify the emission reduction at each CPA or group of CPAs included in the monitoring process. The required data will be obtained by monitoring key data for a random sample of project participating households. The monitored data will be used to determine the emission reduction achieved from each of the monitored households, and this will be used as a basis to determine the average emission reduction from participating households in the CPA or group of CPAs included in the monitoring process.

The average emission reduction per participating household is then multiplied with the number of participating households in the group of CPAs that has been included in the monitoring process, at the time of verification, in order to obtain the total emission reduction for a the given period.

Determine the Sample size

The sample size shall be calculated to assure 90/10 confidence lever or 95/10 if the monitoring is done for a group of CPAs. This shall be done for all the variables subject to monitoring⁴

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

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

Where:

- n = Sample size – number of households needed to be included in sample.
- N = Total number of households that can reply to a particular parameter
- Mean = To be estimated or calculated prior to monitoring
- SD = To be estimated or calculated prior to monitoring
- 1.96 = Represents the 95% confidence required
- 0.1 = represents the 10% relative precision

When calculating the sample size for each of the 3 technologies, it shall always be assumed that there are one million project participating household in the population to be surveyed. This is to be conservative and to ensure that a sufficiently large sample is chosen. As such, the only parameters that will change in order to determine the sample size will be the V-Value that is calculated from the average value and the standard deviation from each of the technologies that are deployed by the program.

Table of expected values to determine the required sample size⁵

Calculation of V- Values	Average ⁶	Standard deviation ⁷	V - Value
Biogas	0.3	0.1	0.111
Ethanol	0.7	0.2	0.082

⁴EB 67, annex 6, paragraph 51.

⁵ This sample size calculation is based on random sample. If it makes a big cost savings, the cluster samples might be used. If cluster samples are to be used for cost efficiency, then the number of clusters shall not be less than 10, and the total number of households sampled shall be larger that of what is used with the random sample calculations above. EB74, Annex 6, paragraph 13.

⁶ Estimated values. These values will be updated when monitoring data become available.

⁷ Estimated values. These values will be updated when monitoring data become available.

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Purified water	15	4	0.071
Default values			
N	1,000,000		
Confidence level	1.96	3.8416	(Valued square)
Required precision	0.1	0.01	(Valued square)
Required minimum sample size:	Formula		Sample size
Biogas	42.68		43
Ethanol	31.36		32
Purified water	27.32		30

When the V-Value increases, the required sample size increases accordingly.

The sample size for each parameter depends on the mean and the standard deviation and the population size. When the population is larger than 1000, the SD is the primary criteria that determine the required sample size for each criteria. The following sample size and SD values apply for indefinitely large populations:

Mean	1	1	1	1	1	1
SD	1	0.8	0.6	0.4	0.2	0.1
n	165	132	99	66	33	17

It must be n number samples for each parameter to be monitored.

In cases where the initial households selected for ~~annual~~-monitoring suevey do not include sufficient samples of one or more of the parameters to be monitored, then stratified random sample shall be used to select the additional households needed for monitoring those parameters in which more samples were needed in order to obtain the required sample size in order to obtain the confidence level of 90/10 for all the parameters to be monitored or 95/10 in case a group of CPAs are monitored at the same time

If additional samples are needed to determine one parameter, lets say biogas usage, then the additional households to be sampled shall be selected from the households that are registered as using biogas stoves.

Summary

- Monitoring will be done at least once every two year.
- Monitoring will be done over a 7 days period for each household monitored.
- Emission reductions will be calculated based on the average emission reduction from the households monitored in each CPA multiplied with the number of participating households at the time of verification
- Monitoring shall be done by trained people from the survey and data collection department. Local assistance might be used, but the trained representative from the survey and collection department must quality check and sign off on all the data collected from each household that is monitored.
- The households selected for monitoring shall be selected randomly, and the number of households shall be sufficient to meet the sample size requirement set forth by the UNFCCC guidelines (see guidelines above)

Equipment to bring to the households to be monitored

- Water containers
- Equipment to measure the quality of the water.
- Ethanol containers. Denatured alcohol shall be bought locally.
- Equipment to measure the ethanol content in the fuel
- Digital camera, with GPS
- Biogas meter.
- Water meter (To monitor water delivered from community based water plant)
- Water quality test kit
- Tablet with monitoring form and copies of all the product data sheets.

Monitoring Process

1. Selection of households to be monitored:

The households shall be selected randomly. The process of choosing random houses shall if possible be followed according to the following procedure:

- a. Determine which technology has the highest V-Value and determine how many households with this technology will be needed for survey. (Let's assume this is biogas)
- b. List all participating households that use biogas, alphabetical or numeral order based on the database for project participants.
- c. Divide the number of identified participating households with the V-value. This figure is referred to as X.
- d. Pick every X household in the list of participating households that use biogas from the list under point ii. These are the households that shall be monitored for use of biogas.
- e. Select the number of households required for monitoring which use other technologies, (ethanol Stoves and purified water). Which are located close to the households that use biogas.

3. Process conducted by the surveyor conducting the monitoring

- a. Register the household to be monitored and fill in the monitoring form with the household identification criteria.
 - i. Write down the GPS coordinates for the household to be monitored
 - ii. Write down the starting time of the monitoring process
 - iii. Write down the type of solutions used by household
 1. Ethanol stove
 2. Biogas stove
 3. Household water purification system
 4. Community water purification system
 - iv. Write down the type of biogas or ethanol stove used.
 - v. Take picture of the equipment
 - vi. Check that the appliances are still operating or are replaced by an equivalent in service appliance.
 - vii. Take picture of the house and the household representative
- b. Start monitoring:

In case the household use ethanol stove, the ethanol stove shall be filled up with new denatured alcohol, and the households will be provided with 20 litre (or alternatively 12 liter) of denatured alcohol to be used during the 7 days monitoring period. The denatured alcohol will be purchased together with the participating household from their primary denatured alcohol supplier. All the denatured alcohol the household have in containers at the start of the monitoring will be set aside and the household will be instructed not to use this denatured alcohol during the following week. A sample of the purity of the denatured alcohol purchased shall be tested for strength (Purity / Net calorific Value) of the denatured alcohol.

In case the households use biogas, a biogas meter shall be installed. The biogas meter shall be installed on the biogas inlet point of the stove.

Households that use purified water, will be given clean but empty water containers will be given 20 cans of clean but empty 10-litre containers. They will be instructed to fill up these containers with purified water that they collect, rather than drink water directly from other containers.

In case the household gets purified water from a community water purification plant, then a water meter shall be installed at the outlet of the water purification plant and the total volume of water produced shall be measured. This value shall then be divided on the number of households that are registered as getting water from the water purification facility.
- c. Test of water samples

A water quality test shall be conducted from a sample of water from each of the households that use purified water (or from the community water source). The water quality analysis could be done by the use of a mobile water testing kit. The water quality analysis could be conducted by the surveyor.

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In case a monitored household get purified water from a community based water purification plant, the water purification plant shall be identified and it shall be determined if the plant is using non-renewable fuel for the water purification process. A short report including the fuel used by the community water purification plant and the contract information for those operating the plant shall be enclosed with the monitoring report.

- d. Complete the monitoring. This shall be done exactly one week after the start of the monitoring for each household.
 - i. The ethanol tank/canister in the ethanol stove shall be filled up. The remaining of the 20 (or alternatively 12 liter) litre of denatured alcohol given to the household at the start of the monitoring period shall be measured. The total denatured alcohol consumption for the household during the week will then be 20 (or alternatively 12 liter) litre – minus – the denatured alcohol they have left at the completions of the monitoring period. The value shall be recorded.
 - ii. The biogas meter will be read and removed. The biogas usage shall be recorded.
 - iii. The total volume of water available in the household after the monitoring period shall be measured and recorded. The water consumption will be based on the number of water containers that has been used during the week, with a subtraction for the water left in the water containers. Alternatively the water from the community water purification plant shall be monitored and the total volume of water produced shall be divided by the number of households obtaining purified water from the community water purification plant.
- e. Filling in the monitoring form. All the findings from the monitoring process shall be filled in the monitoring form provided in this document.
- f. Quality control.
 - i. The monitoring manager shall review all the monitoring forms to make sure they are all correctly filled in. He shall also ensure that the forms corresponds to the households that were preselected for monitoring
 - ii. In case of unusual replies or readings, the quality control manager shall visit the household and provide a short report explaining the reason for the unusual reading, or alternatively redo the monitoring process.
- g. Households that cannot be found, or which monitoring can not be conducted or which is found not to use any of the solutions deployed by the program shall be included in the program. These will then be registered as a project participant with no emission reduction.
- h. Returning the monitoring reports to the PoA recording and Data manager. This shall be done by email.
 - i. The surveyor or the survey manager shall save the survey forms on their tablet as a backup.
 - ii. Data Recording and Data Manager shall confirm by email that the survey form has been received and that it is correctly filled.

3. Data processing

- a. PoA recording and Data manager shall review all the monitored data and save these data into a database.
- b. The recording and data manager will calculate the emission reduction from each of the sampled households, and calculate the average emission reduction and multiply this with the number of project participating households in the group of CPAs in order to determine the total emission reduction during the period. This shall be done through the standard spreadsheet used to calculate emission reductions.

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Example of monitoring form

<u>Country</u>	
<u>CPA reference</u>	
<u>Household identification reference</u>	
<u>Name of person in the household</u>	
<u>Address</u>	
<u>Phone number</u>	
<u>GPS data</u>	
<u>People in Household</u>	
<u>CPA registration data</u>	
<u>Date and time of Start of Monitoring</u>	
<u>Data and time of completion of Monitoring</u>	
<u>Type of solutions used provided by the program</u>	
<u>Ethanol stove (Yes or No)</u>	
_____ <u>Type of ethanol stove</u>	
_____ <u>Denatured alcohol volume at start of monitoring (liter)</u>	
_____ <u>Denatured alcohol volume at end of monitoring (Liter)</u>	
<u>Purity of the denatured alcohol (%)</u>	
<u>Biogas stove (Yes or No)</u>	
<u>Type of biogas stove</u>	
<u>Biogas readings (in m3)</u>	
<u>Household water purification system (Yes or No)</u>	
<u>Type of purification system</u>	
<u>Household Water consumption during the monitoring period (liter)</u>	
_____ <u>Water quality within predefined qualify standard (Yes or No)</u>	
<u>Did household have access to purified water prior to project registration date?</u>	
<u>Thermal energy output from the water purification system (If available)</u>	
<u>Do the household continue to boil their drinking water (Yes or No)</u>	
<u>Solution distributed under project activity operational or non-operational</u>	
<u>Whom is the primary fuel supplier:</u>	
_____ <u>Phone Number</u>	
_____ <u>Address</u>	
_____ <u>Fuel supplied</u>	
<u>Name of person that conducted the monitoring</u>	
<u>Phone number of person conducting the monitoring</u>	
<u>Supplier of denatured alcohol, biogas and purified water:</u>	
<u>Special comments or issues:</u>	

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In case verification of more than one CPA is carried out at the same time, the DoE may consider the latest guidelines available from the CDM Executive Board (CDM EB) to carry out verification following a sampling approach. In such circumstances, the DoE would undertake a detailed verification (including site visits) for only a sample number of CPAs. The sample size will be calculated as per the sampling guidance issued by the CDM-EB. In case there are discrepancies between the emission reductions (ERs) reported in the monitoring report and the ERs verified by the DoE (on the basis of detailed review), for those sample CPAs that are subject to detailed review, or for those households that has been subject to detailed review, an adjustment factor (as described below) shall be worked out and the same shall be applied to adjust the ERs reported in the monitoring reports of the other CPAs, or for the other households, for which the DoE did not carry out a detailed review (including site visit). Request for issuance of CERs should be made for the adjusted ERs.

$$ER_{i, \text{adjusted}} = ER_{i, \text{reported}} \times F_{\text{adj}}$$

$$F_{\text{adj}} = (\sum ER_{j, \text{verified}} / \sum ER_{j, \text{reported}})$$

Where,

$ER_{i, \text{adjusted}}$ = Adjusted ERs from CPA i , which is not subject to detailed review.

$ER_{i, \text{reported}}$ = ERs reported in the monitoring report for CPA i , which is not subject to detailed review.

$ER_{j, \text{verified}}$ = ERs verified by the DoE for CPA j , which is subject to detailed review.

$ER_{j, \text{reported}}$ = ERs reported in the monitoring report of CPA j , which is subject to detailed review.

i = Number of CPAs, which are not subject to detailed review.

j = Number of CPAs, which are subject to detailed review.

The records and documentations pertaining to monitoring and verifications for all the CPAs participating in the program would be maintained by CME and shall be made available to DoE for checking status at any point of time. The DoE will be provided with all the monitoring reports and other programme related documents of each CPA during verification. The DoE shall hold all technical discussions with the CME and may visit only the sample facilities / CPAs as described above.

Representative sampling.

A stratified random sample of households might be selected among all project participating households registered under the PoA. The average emission reductions from each of the households subject to ~~annual~~ monitoring ~~survey~~ will be used as the values to determine emission reduction in each CPA included in the PoA at the time of the ~~annual~~ monitoring ~~survey~~. The sampling approach follows the "Sampling and survey for CDM project activities and programmes of activities" EB 74, annex 6.

The number of samples required to achieve a 90/10 confidence level shall be used. In case verification is done for a group of CPAs, then the confidence level of 95/10 shall be achieved. The sample size has also been calculated in accordance with Guidelines for sampling and surveys for CDM Project activities and programme of activities, EB 69 annex 5. Other process for determining sample size and samples might be used in accordance with new and updated guidelines from EB such as EB 74 annex 6, which also allows for cluster sampling.

SECTION C. Start date, crediting period type and duration

C.1. Start date of CPA

>>

11/11/2013

The starting date of project implementation as per the end user agreement with the first household included in the CPA.

C.2. Expected operational lifetime of CPA

>>

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The project will have a life span of 21 years. The individual ethanol stoves, biogas stoves and water purification filters will have to be changed many times during the life of the operational lifetime of the SSC-CPA.

C.3. Crediting period of CPA

C.3.1. Type of crediting period

>>

Renewable crediting periods. First crediting period.

C.3.2. Start date of crediting period

>>

2801/054/2014 or the date of inclusion whichever is later.

C.3.3. Duration of crediting period

>>

7 years crediting period. 3 crediting periods. Total 21 years.

SECTION D. Environmental impacts

D.1. Analysis of environmental impacts

>>

National Environmental Impact Assessment Study was carried out. A national environmental Impact Assessment Study has been carried out at a national level for the first CPA in each country in accordance with the PoA DD.

Environmental Impacts:

- Unlike fossil fuel or wood fuel combustion, biogas production from biomass is considered CO₂ neutral and therefore does not emit additional greenhouse gases (GHG) into the atmosphere.
- Greenhouse gases released in the production and consumption of ethanol fuel are reabsorbed during the growth cycle of the plant material used to make the fuel
- Technologies for biogas transform organic waste into energy, thus activating the normal process of natural decomposition. The bio-slurry will improve soil structure and texture, thus reducing degradations and further land encroachment
- The release of methane is avoided thus contributing to climate mitigation
- The use of ethanol stoves can generate highly valuable carbon credits to cash.

No major negative environmental impacts from the proposed solutions to be deployed by the CPA can be identified.

The environmental Assessment report has been submitted to DOE.

D.2. Environmental impact assessment

>>

The environmental impact assessment was carried out at National level in accordance with the PoA DD.

SECTION E. Local stakeholder consultation**E.1. Modalities for local stakeholder consultation**

>>

Stakeholders have been invited to comment on the program on a national level. This is in accordance with the PoA DD, where it is stated that the first CPA in each country might conduct a stakeholder consultation at a national level.

E.2. Summary of comments received

>>

No negative comments on the program have been received.

E.3. Consideration of comments received

>>

Most of the issues that were addressed by the stakeholders had been addressed by the World Bank in the comprehensive study that had been undertaken prior to program design. As such, the program had taken many of these concerns into consideration in the program plan prior to the stakeholder consultation.

The program has put particular emphasis on the comments related to;

- Fuel safety
- The consumer cost of the stoves and water filters
- The production of denatured alcohol fuel
- Maintenance of the community water purification systems

SECTION F. Eligibility for inclusion

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	Boundary and Location of the CPA	<p>The CPA is located within geographical areas included in the PoA.</p> <p>It has been considered if there are any time-induced boundaries to be consistent with the geographical boundaries of the PoA. No time-induced boundaries have been found.</p>	<p>The boundary of the CPA is the same as the boundary of Nigeria</p> <p>Document:</p> <p>CME confirms that the boundary of the CPA is within Nigeria-</p>	<p><u>CPA is in compliance with the eligibility criterion based on the required condition as supported by the supporting evidence for inclusion</u></p>

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No.	Eligibility criterion - Category	Eligibility criterion - Required condition	Supporting evidence for inclusion	Description of this CPA in relation to the criterion and supporting evidence
2	No double counting.	<p>A unique numbering system for each project participating household within the CPA. The unique numbering will consist of a country code, a CPA number within the country and a unique ID number for each project participating household in the CPA. A contract with all the participating households confirms that the households are not part of any other system that generates carbon credits. The contract can be a written contract signed by individual households, or it can be a contract submitted through the representative from the LPIP through a smart phone application, subject to the households approving all the information filled out by the LPIP.</p> <p>The Reporting and Data Recording Department shall implement a system where it will be automatically registered if two project participating households has:</p> <ol style="list-style-type: none"> 1. The same contact name and phone number, or, 2. The same ID number 	<p><u>The specific numbering system included in the specific CPA-DD and the end user agreement with each participating households:</u></p> <p><u>Documentation:</u></p> <p><u>End user agreement template.</u></p> <p>The specific numbering or identification regime is included in the specific CPA-DD- Document:</p> <p>a) CPA numbering according to PoA. CPA unique identification number is NI-004. NI refers to Nigeria and 004 refers to the CPA number in Nigeria.</p> <p>b) The numbering system for each project participating households within the CPA is a number from 1 to 90 000.</p>	<p><u>CPA is in compliance with the eligibility criterion based on the required condition as supported by the supporting evidence for inclusion</u></p>

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No.	Eligibility criterion - Category	Eligibility criterion - Required condition	Supporting evidence for inclusion	Description of this CPA in relation to the criterion and supporting evidence
3	Technological requirements	<p>The CPA consists of solutions to reduce emission from burning non-renewable woody biomass for cooking. The solutions include:</p> <ol style="list-style-type: none"> 1. Biogas stoves. The type of biogas stove shall have a thermal output of no more than 10 kW and thermal efficiency of no less than 50%. 2. Ethanol stove that shall have a thermal output of no more than 10 kW and a thermal efficiency of no less than 50%. 3. The community water purification systems shall provide water that meet applicable national microbiological standards / guidelines or WHO's interim performance target on household water treatment, and have energy output of less than 540 kW. 4. The Household water purification systems shall provide water that meet applicable national microbiological water quality standards / Guidelines or WHO's interim performance target on households' water treatment. As the system does not have a measurable energy output, the energy output will be estimated based on the energy output per household in the community water purification system in accordance with the CDM PoA DD. 5. The water purification system is using non-renewable energy sources. 	<p>The thermal output and thermal efficiency of the biogas stoves and the ethanol stoves used in the CPA shall be determined by product specification provided by the equipment (stove) supplier.</p> <p>In cases where such documentation is unavailable the thermal output and thermal efficiency shall be determined by a qualified laboratory.</p> <p>Document:</p> <p><u>Product Data sheet or product specification provided by the product supplier or a certified laboratory product test.</u></p> <p><u>This will be provided during monitoring and such documentation shall then be provided for all the equipment used in each CPA. The equipment listed below has been preapproved for CPA inclusion. Further products to be included in the CPA.</u></p> <p>Documentation:</p> <p>a) Biogas stove: http://www.alibaba.com/product-detail/Biogas-Stove_254849645.html</p> <p>b) Ethanol stove: http://stoves.projectgambia.com/files/DometiCleanCookBROCH2010.pdf</p> <p>c) Community-based water purification systems</p>	<p><u>CPA is in compliance with the eligibility criterion based on the required condition as supported by the supporting evidence for inclusion</u></p>

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No.	Eligibility criterion - Category	Eligibility criterion - Required condition	Supporting evidence for inclusion	Description of this CPA in relation to the criterion and supporting evidence
4	CPA start date	<p>CPA start date shall not be before PoA registration date and not before the CPA baseline study has been conducted.</p> <p>The start date is;</p> <p>A. From the date in which the first households within the CPA is registered as a project participant</p> <p>or</p> <p>The start date of the CPA according to the start date in the CPA DD.</p> <p>The start date is the date that is latest of the two dates.</p> <p>Please note that equipment might be deployed in the CPA during the time after the CPA registration date and before the CPA start date according to the CPA DD. In such cases, emission reductions will only be calculated from the project start date, according to the CPA DD.</p>	<p>The starting date of the program is the 30/11/2012. The expected start date of CPA is 13/11/2011</p> <p>Documentations;</p> <ol style="list-style-type: none"> 1. Baseline survey, 2. This CPA-DD. 	<p><u>CPA is in compliance with the eligibility criterion based on the required condition as supported by the supporting evidence for inclusion</u></p>
5	Conditions that ensure compliance with methodology	Households have been using woody biomass since 1989.	<p>Documentations:</p> <p>Baseline survey from 2013.</p>	<p><u>CPA is in compliance with the eligibility criterion based on the required condition as supported by the supporting evidence for inclusion</u></p>

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No.	Eligibility criterion - Category	Eligibility criterion - Required condition	Supporting evidence for inclusion	Description of this CPA in relation to the criterion and supporting evidence
6	Additionality by CPAs	<p>The employed technologies are within the positive list of technologies and project activity types that are defined as automatically additional.</p> <p>The project activities solely consist of households or communities or small and medium enterprises (SMEs) and where the size of each unit is no larger than 5% of the small-scale CDM threshold.</p> <p>As the small scale threshold is 45 MW, the project activity is considered additional if the project activity solely consist of households or communities or small and medium enterprises where the installed capacity at each project participant is less than 2.25 MW.</p>	<p>Documents:</p> <p>CPA-DD</p>	<p><u>CPA is in compliance with the eligibility criterion based on the required condition as supported by the supporting evidence for inclusion</u></p>
7	Stakeholder consultation and Environmental Impact Assessment	<p>Stakeholder consultation and environmental impact assessment will be done for each CPA.</p> <p>For the first CPA in each country, the stakeholder consultation and the Environmental Impact Assessment might be done on the national level as an alternative to the CPA specific stakeholder consultation and the CPA specific Environmental Impact Assessment. If so, the stakeholder consultation must include stakeholders that are represented in the CPA area and or are familiar with the conditions in the CPA area. If a national level Environmental Impact Assessment is done for the first CPA in the country, the conditions in the CPA area should be representative for the country.</p>	<p><u>Documentation:</u></p> <p><u>1. Stakeholder consultation report</u></p> <p><u>2. Environmental Assessment report</u></p> <p><u>Documentation:</u></p> <p><u>a) Stakeholder consultation report, 2013 based on the stakeholder consultation from February 2013, which was carried out on a national level according to the PoA.</u></p> <p><u>b) Environmental Assessment report from February 2013, which was carried out on a national level in accordance with the PoA.</u></p>	<p><u>CPA is in compliance with the eligibility criterion based on the required condition as supported by the supporting evidence for inclusion</u></p>

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No.	Eligibility criterion - Category	Eligibility criterion - Required condition	Supporting evidence for inclusion	Description of this CPA in relation to the criterion and supporting evidence
8	Non-Diversion of ODA in case of Public funding	The CME shall confirm that in case of public funding there shall not be diversion of Official Development Assistance.	Documentation: CME confirm that the project has not received any public funding.	CPA is in compliance with the eligibility criterion based on the required condition as supported by the supporting evidence for inclusion
9	Sampling requirements	<p>Sampling will be done for;</p> <ol style="list-style-type: none"> 1. The baseline survey and 2. To determine the emission reduction during the monitoring process. <p>For both of these processes the project will comply with the requirement of a 90% confidence interval and a 10% margin of error.</p> <p>In case if the option for doing verification for a group of CPAs, then the confidence level of 95/10 shall be achieved in accordance with EB74, annex 6 or the latest standards</p> <p>The emission reduction will be calculated based on ex-post survey.</p> <p>The baseline survey shall be done on a sample size of at least 68 households.</p>	Documentations: Baseline survey, 2013.	CPA is in compliance with the eligibility criterion based on the required condition as supported by the supporting evidence for inclusion

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No.	Eligibility criterion - Category	Eligibility criterion - Required condition	Supporting evidence for inclusion	Description of this CPA in relation to the criterion and supporting evidence
10	SSC Limit for CPAs	<p>The CPA will remain under the thermal threshold of 45 MW throughout the crediting period of the CPA.</p> <p>Please note that not all equipment necessarily have been deployed at CPA inclusion date. The SSC limit for CPAs shall be checked during verification, and in case any deployed solution will be found to be not in line with CPA SSC limit for CPAs requirement, those equipments will not be counted for in the emission reduction calculations.</p> <p><u>For the supply of purified water, the energy output is based on the energy output of 0.5 kW per project participating household that is provided with purified water. Thermal output is determined to be 0.5 kW for each household that got purified water as part of the project.</u></p>	<p>Documentation: CME confirm that the total installed capacity of the deployed equipment will remain under 45 MW.</p> <p>The excel spread sheet confirms the thermal capacity of the equipment that is expected to be installed.</p>	<p><u>CPA is in compliance with the eligibility criterion based on the required condition as supported by the supporting evidence for inclusion</u></p>
11	De-bundling	<p>The CPA is exempted from performing the de-bundling check since each individual sub-system and each participating household has thermal energy savings of less than 1% of the SSC threshold and will remain within this threshold throughout the crediting period.</p> <p>Please note that not all equipment and solutions may have been deployed at the CPA inclusion stage but the 1% threshold can however also be checked during verification, and in case of any participating household will be found not in line with the De-bundling requirements, those households will not be counted for in the emission reduction calculations.</p>	<p>Documentation: PoA DD defines that the maximum thermal output of any equipment included in the program is defined as 50 kW in accordance with the eligibility criteria. As the SSC threshold is 45 MW, the threshold for exemption from performing a de-bundling check will be 450 kW. The threshold for exemption from performing the de-bundling check will not be reached.</p>	<p><u>CPA is in compliance with the eligibility criterion based on the required condition as supported by the supporting evidence for inclusion</u></p>

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No.	Eligibility criterion - Category	Eligibility criterion - Required condition	Supporting evidence for inclusion	Description of this CPA in relation to the criterion and supporting evidence
12	CER ownership	The CERs shall be the sole ownership of the CME, and the CME shall provide part of the income generated from the CERs to pay for subsidies of the equipment to be deployed in the CPA. Please note that loan agreements might be made so that the equipment will be financed by loans to be paid for with the income generated from the sales of the CERs	Documentations: a) End user agreements. The contractual agreement template between CME and the project partners and distributors.	CPA is in compliance with the eligibility criterion based on the required condition as supported by the supporting evidence for inclusion
13	CPA crediting Period	CPA starting date of the crediting period of inclusion into registered PoA or any date thereafter and crediting period not to exceed the PoA end date.	Documentations: The CPA starting date of the crediting period will be from <u>2804/054/2014</u>	CPA is in compliance with the eligibility criterion based on the required condition as supported by the supporting evidence for inclusion
14	Approval of CPA by CME	CME approves the inclusion of this project in the SSC PoA	Documentations: CME confirm that the CPA can be included in the PoA.	CPA is in compliance with the eligibility criterion based on the required condition as supported by the supporting evidence for inclusion
15	Legal requirements	CME has commissioned studies in each country included in the program to determine if there are any legal or policy requirements for households to use the equipment promoted by the PoA or that there are any law or policy against using such solutions.	Documentation: • „Letter Policy Nigeria“ as documents provided as part of PoA DD validation	CPA is in compliance with the eligibility criterion based on the required condition as supported by the supporting evidence for inclusion
16	Confirm that the project is not registered with another CPA or CDM project	The baseline survey will confirm that the solutions to be employed by the program of activities in the particular CPA have not been employed prior to the project registration. The end user contracts will confirm that the end user solutions provided as part of the CPA is not part of any other program that might generate carbon credits	Documentations: End user agreement template.	CPA is in compliance with the eligibility criterion based on the required condition as supported by the supporting evidence for inclusion

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No.	Eligibility criterion - Category	Eligibility criterion - Required condition	Supporting evidence for inclusion	Description of this CPA in relation to the criterion and supporting evidence
17	Exclusivity of boundary	No component of a project activity of one CPA shall be part of any other CPA. Every project participating household is exclusive to one CPA ² .	<p>Documentations: CME confirm that no component of the CPA is part of any other under the PoA.</p> <p><u>"Unique id system for each household shall be defined at the time of CPA inclusion in order to avoid any double counting. This unique id shall be verified at the time of CPA inclusion. This unique id(code) shall be archived in CME database."</u></p> <p><u>End user agreement, End-user agreement template.</u></p> <p><u>Copy of the Unique ID number created by households registered in a CPA already registered under the CDM PoA.</u></p> <p>Examples: Nigeria -- CPA-NI-004-1 Nigeria -- CPA-NI-004-2 Nigeria -- CPA-NI-004-3 Nigeria -- CPA-NI-004-4</p>	<u>CPA is in compliance with the eligibility criterion based on the required condition as supported by the supporting evidence for inclusion</u>

Appendix 1. Contact information of CPA implementers

Organization name	Green Development AS
Country	Norway
Address	Trosviksodden 8, Vetre
Telephone	+4793630730
Fax	Not available
E-mail	jn@greendevlopment.no
Website	www.greendevlopment.no
Contact person	Havard Norstebo

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Appendix 2. Affirmation regarding public funding

No public funding is provided for the proposed CPA.

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

Not applicable

Appendix 4. Further background information on monitoring plan

Not applicable

Appendix 5. Summary report of comments received from local stakeholders

Not applicable

Appendix 6. Summary of post-registration changes

PRC to version 8

Corrections includes

1. Use of latest version of the form. This include updating the eligibility criteria in accordance with the latest version of the PoA DD.
2. Updated the value of the ex-ante parameter "NCV_{biogas}" of the CPA-DDs to be in line the PoA DD.
3. Update the monitoring process description to check that the appliances are still operating or are replaced by an equivalent in service appliance, in accordance with the methodology and the latest version of the PoA DD.
4. Update the start of the crediting period in accordance with the start of the crediting period as listed on the UNFCCC webpage.
5. Provided further clarification of the technology in accordance with the registered PoA DD.
6. Clarified that monitoring survey should be done at least every two years, in accordance with the methodology and the PoA DD.
7. Corrected Eligibility Criteria 3.3 to be in compliance with the PoA DD.
8. Editorial corrections.

Permanent changes to the registered monitoring plan

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The following permanent changes to the registered monitoring plan have been made so as to be in compliance with the latest version of the PoA DD.

1. Clarified that monitoring survey should be done at least every two years.
2. Addition of text to clarify that during 7 days of monitoring period household can alternatively be provided with 12 litres of denatured alcohol in place of 20 litres in accordance with the registered PoA DD.
3. Households that use purified water will be given clean but empty water containers.

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Document information

Version	Date	Description
09.0	31 May 2019	Revision to: <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • Include provisions related to statement on erroneous inclusion of a CPA; • Include provisions related to delayed submission of a monitoring plan; • Provisions related to local stakeholder consultation; • Provisions related to the Host Party; • Make editorial improvement.
03.0	25 June 2014	Revisions to: <ul style="list-style-type: none"> • Include the Attachment: Instructions for filling out the component project activity design document form for 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

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<i>Version</i>	<i>Date</i>	<i>Description</i>
		responsible person/ entity for completing the CDM-CPA-DD-FORM in A.13. and Appendix 1;
		<ul style="list-style-type: none">• 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		