PROGRAMME DESIGN DOCUMENT FORM FOR SMALL-SCALE CDM PROGRAMMES OF ACTIVITIES (F-CDM-SSC-PoA-DD) Version 02.0

PROGRAMME OF ACTIVITIES DESIGN DOCUMENT (PoA-DD)

PART I. Programme of activities (PoA)

SECTION A. General description of PoA

A.1. Title of the PoA

Impact Carbon Global Safe Water Programme of Activities (PoA)

Version: 3.0

Date of Completion: 24/03/2014

A.2 Purpose and general description of the PoA

Policy Measure/Stated Goal:

The stated goal of the PoA is the widespread dissemination and use of low-carbon water purification technologies to households, communities, and institutions throughout Rwanda and Uganda. Institutional applications may include schools or prisons. Community applications may include restaurants, community centres, villages, offices, or health centres. The PoA will use carbon finance to support local partners engaged in the production, distribution, sale, and support of various water purification technologies described below.

Framework for the Implementation of the PoA:

Impact Carbon, the Coordinating/Managing Entity (CME), oversees each step of the PoA development, PoA expansion, the CPA inclusion process including checking the eligibility criteria per CPA, developing the project documents, implementation of the local stakeholder consultation, developing a monitoring and evaluation plan, managing CPA inclusion, on-going verifications, and the issuance of credits.

The PoA will include five distinct CPA types, including the following combinations of water purification technology types and user groups:

1) Small-scale technologies for household water consumption, with no project emissions

Technologies shall be used in households and may include:
- Water filters: e.g. ceramic, membrane, sand, activated carbon, etc.
- Solar disinfection devices
- Chemical disinfection

Technologies are designed for low flow consumption and are ideal for household use.

2) Technologies for institutional water consumption, with no project emissions

Technologies shall be installed in institutions and may include:
- Water Filters
- Solar Disinfection devices

- Chemical Disinfection
- Ultrafiltration Devices
- Ultraviolet disinfection devices with renewable power

Ultraviolet disinfection devices which require electricity shall be installed with solar systems for large-scale consumption in institutions, such as schools or prisons, which lack access to any reliable electricity supply. Monitoring of a sample of solar powered UV disinfection devices shall include confirmation of use according to manufacturer specifications, i.e. not connected to alternate source of energy, as part of the *Operational Units*$_i$ parameter. If energy source other than installed solar panel is used, the unit will be considered to be not in use for the monitoring period. Through use of Operational Units parameter, the fraction of units within the sample found using an alternate energy source and considered not in use shall be applied to the population of units of the same technology type.

3) Technologies for institutional water consumption, with project emissions

Technologies shall be installed in institutions and result in project emissions. Technologies may include:

- Ultraviolet disinfection devices
- Reverse Osmosis systems

Technologies shall not be installed with a solar PV system for electricity supply. While the target group is identical to CPA type 2, as the technologies generates project emissions, it must be considered as a separate CPA type.

4) Technologies for community water consumption, with no project emissions

Technologies shall be installed in community centers that have variable users, such as restaurants, villages, offices, retail vendors, or health centres and may include:

- Water Filters
- Solar Disinfection
- Chemical Disinfection
- Ultraviolet disinfection devices with renewable power

Community refers to a group of people in close geographic proximity, accessing the same resources and facilities. In the case of CPA type, community applications are applied for technologies used in situations with variable users. Due to variable users and quantity consumed, the quantity of water purified in this CPA type will be measured directly from a representative sample. No technologies in this CPA type result in project emissions.

Ultraviolet disinfection devices which require electricity shall be installed with solar systems for large-scale consumption in community applications, such as restaurants, villages, offices, retail vendors, or health centers, which lack access to any reliable electricity supply. Monitoring of a sample of solar powered UV disinfection devices shall include confirmation of use according to manufacturer specifications, i.e. not connected to alternate source of energy, as part of the *Operational Units* parameter. If energy source other than installed solar panel is used, the unit will be considered to be not in use for the monitoring period. Through use of Operational Units parameter, the fraction of units within the sample found using an alternate energy source and considered not in use shall be applied to the population of units.

5) Technologies for community water consumption, with project emissions

Technologies shall be installed in community centers that have variable users, such as restaurants, villages, offices, retail vendors, or health centres and result in project emissions. Technologies may include:

- Ultraviolet disinfection devices
- Reverse Osmosis systems

Both technologies may be used in water kiosks. Neither technology type shall be installed with a solar PV system for electricity supply. While the target group is identical to CPA type 4, as the technologies utilize electricity and generate project emissions, it must be considered as a separate CPA type.

While CPA types are not defined regionally, individual CPAs included will be implemented in one country, and may have a regional focus.

All water purification systems will be distributed to end-users or community leader in case of community target groups directly via a Sales Representative, who collects user or community level information via a Sales Receipt and explain how to correctly use the system. The end-user or community leader will also be provided with the contact details of the CME/CPA Implementer, whom they can contact should any maintenance of the system be required, or if their contact details (e.g. address) change.

The CME works actively with local partners to improve sales and dissemination strategies; in some cases the CME may be the CPA implementer and will be directly responsible for sales and dissemination. The CME actively brings other local partners into the project to enhance the dissemination and distribution capacity of the project as a whole. Local partners may include but are not limited to NGOs, local entrepreneurs, government organizations and academic institutes. Distribution channels of project technologies will vary based on the partner, but may involve both direct sales to clients from CPA implementers and sales through distribution partners. The CME will oversee all distribution efforts to end users[1] and govern that process through detailed operations manuals with partner organizations. Distribution will include the capture of end user information and appropriate record keeping.

Background

Households throughout Rwanda and Uganda lack access to reliably safe drinking water. In Rwanda only 32% of the population use piped water, with only 3.4% having access to piped water within their homes. This is especially true of rural areas where only 0.9% of the population have access to piped water within their homes.[2,3] In Uganda, 64% of rural households have access to an "improved water source," including protected springs and piped water schemes; however, none of these systems consistently supply safe water as they are not treated and contamination is frequent, particularly during the rainy season. While urban areas are serviced by piped water systems, in both Rwanda and Uganda piped water systems are often in disrepair due to aged systems and insufficient capacity for operation and maintenance.[4,5,6] Further, an official in Uganda stated that there is a potential for bias in government reporting on their initiatives to provide safe water, noting that most think it is preferable to report that the situation is positive, regardless of the reality.[7] Sector experts throughout Uganda and Rwanda corroborate that the water consumed at the household level should not be considered safe to drink and should be treated.[8,9]

[1] In case of institution and community applications, 'end user' refers to the individual who purchased the product for institution or community center where not otherwise specified.
[2] National Policy & Strategy for Water Supply and Sanitation Services, Rwanda MinistR_y of Infrastructure. Page 7
[3] Water Supply and Sanitation in Rwanda. Turning Finance into Service for 2015 and beyond. AMCOW Page 19
[4] National Policy & Strategy for Water Supply and Sanitation Services, Rwanda Ministry of Infrastructure. Page 7
[5] Water Supply and Sanitation in Rwanda. Turning Finance into Service for 2015 and beyond. AMCOW Page 19
[6] Ministry of Water and Environment, Water and Environment Sector Report 2012, p. 114
[7] Validation Site Visit Interview: Ministry of Water and Environment, Uganda, 13/3/2013
[8] Validation Site Visit Interview local expert: Daniel Allolya, Tiva Water, 13/9/2013
[9] Validation Site Visit Interview: Julius Ecuru, Academic, 20/9/2013

In Uganda, 43.9% of households boil their water to treat it, with 95.5% of all households using biomass for cooking and boiling water.[10] In Rwanda, 41.2% of households boil their water and 77% of households nationwide use wood for cooking.[11] The vast majority of the woody biomass in both countries is non-renewable, with the national fraction of non-renewable biomass at .82 in Uganda and .98 in Rwanda.[12] The high proportion of non-renewable biomass demonstrates that typical household water boiling contributes to deforestation and threatens biodiversity. With significant portions of the population using unimproved cooking stoves – 87.6% in Uganda[13] and 16.5% in Rwanda[14], many families that purify water through boiling are left vulnerable to the negative effects associated with the emission of greenhouse gases, while those that do not boil, or only boil occasionally, suffer from waterborne diseases. Traditional stoves and diseases induced from unsafe drinking water account for 12,500 and 16,700 deaths respectively in Rwanda and 19,700 and 27,200 deaths respectively in Uganda.[15,16] Globally, exposure to the harmful pollutants generated from traditional stoves and diseases induced from drinking non-treated water are responsible for over 5 million deaths globally per year, 1.5 million and 3.5 million respectively[17]

The PoA follows *AMS-III.AV low greenhouse gas emitting safe drinking water production systems Version 4*. As this is a small-scale methodology, each CPA under the PoA will achieve emission reductions below 60,000 tCO_2e per annum. Low greenhouse gas emitting water purification systems (WPS) reduce fossil fuel and non-renewable biomass use, relative to the baseline scenario, thereby achieving emission reductions.

The CME and various local partners shall work together to disseminate a range of eligible technologies to households/institutions/communities within the PoA boundary.

Environmental benefits

The project eliminates the demand for non-renewable biomass and fossil fuels required for water boiling thus reducing the rate of deforestation connected to biomass fuel consumption. In addition, the reduction in boiling will yield a reduction in emissions from fuel combustion thus improving air quality and reducing the expulsion of harmful gases that contribute to climate change.

Social and economic benefits

Households using the water treatment technologies will no longer be required to boil water for consumption, directly reducing the amount of fuel wood burned within the home. This means that less harmful pollutants will be emitted, an important improvement as indoor air pollution has been proven to have direct correlation with respiratory illness and mortality rates, especially among women and children, worldwide. These water treatment technologies will also yield a potable water supply that is easy to access and replenish. Families will no longer be exposed to water borne diseases, a leading cause of death for children under the age of five.[18]

[10] Uganda Demographic Health Survey 2011
[11] Rwanda Demographic and Health Survey 2010
[12] Default Values of Fraction of Non-Renewable Biomass http://cdm.unfccc.int/DNA/fNRB/index.html
[13] Uganda National Household Survey 2009/2010, Uganda Bureau of Statistics, p.118
[14] Biomass Energy Strategy Rwanda 2009. P.18
[15] WHO: Country Profile of Environmental Burden of Disease 2009: Rwanda
[16] WHO: Country Profile of Environmental Burden of Disease 2009: Uganda

[18] WHO, *Global Water Supply and Sanitation Assessment 2000 Report*, 2000, http://www.who.int/docstore/water_sanitation_health/Globassessment/Global1.htm#1.1

The reduction in fuel needs will also save time and income. Those who gather wood will see a significant reduction in the amount required to collect fuel, leaving that time available for other activities. Moreover end users who purchase wood, kerosene or liquefied petroleum gas (LPG) will be able to direct more of their income to other needs.

Also from the economic perspective, the project will contribute to the scale-up of local business and organizations, with the potential to create jobs in assembly, retail, marketing, distribution, and maintenance of the water purification systems. As most of the materials are locally manufactured, jobs could be created on the production side as well. The open nature of the project will allow for other local water treatment partners to be included as the project evolves, making the opportunities for scale-up and economic advancement available to additional partners over time.

Confirmation that the project is voluntary:

The implementation of the PoA is a voluntary action by the CME and all other participants. There are no laws or regulations in place, which require the measures or goals of the PoA to be enforced.

A.3. CMEs and participants of PoA

Impact Carbon is the Coordinating/Managing Entity (CME) of the PoA.

Impact Carbon is a non-profit carbon project developer with deep expertise in leveraging carbon finance to develop and scale projects that disseminate improved household energy technologies. These improved technologies simultaneously reduce greenhouse gas (GHG) emissions and provide benefits to local communities by reducing poverty and improving health and the environment.

A.4. Party(ies)

Name of Party involved (host) indicates a host Party	Private and/or public entity(ies) project participants (as applicable)	Indicate if the Party involved wishes to be considered as project participant (Yes/No)
Rwanda (Host Party)	Impact Carbon (Private) (Coordinating/Managing Entity)	No
Uganda (Host Party)	Impact Carbon (Private) (Coordinating/Managing Entity)	No

In addition to the parties listed above, the geographic boundary under this PoA may be expanded at a future date, following the guidelines outlined in the paragraphs 25 – 27 of the *Standard for demonstration of additionality, development of eligibility criteria and application of multiple methodologies for programme of activities* (EB 74, Annex 5).

A.5. Physical/ Geographical boundary of the PoA

The physical/geographical boundary of the PoA is the countries of Rwanda and Uganda.

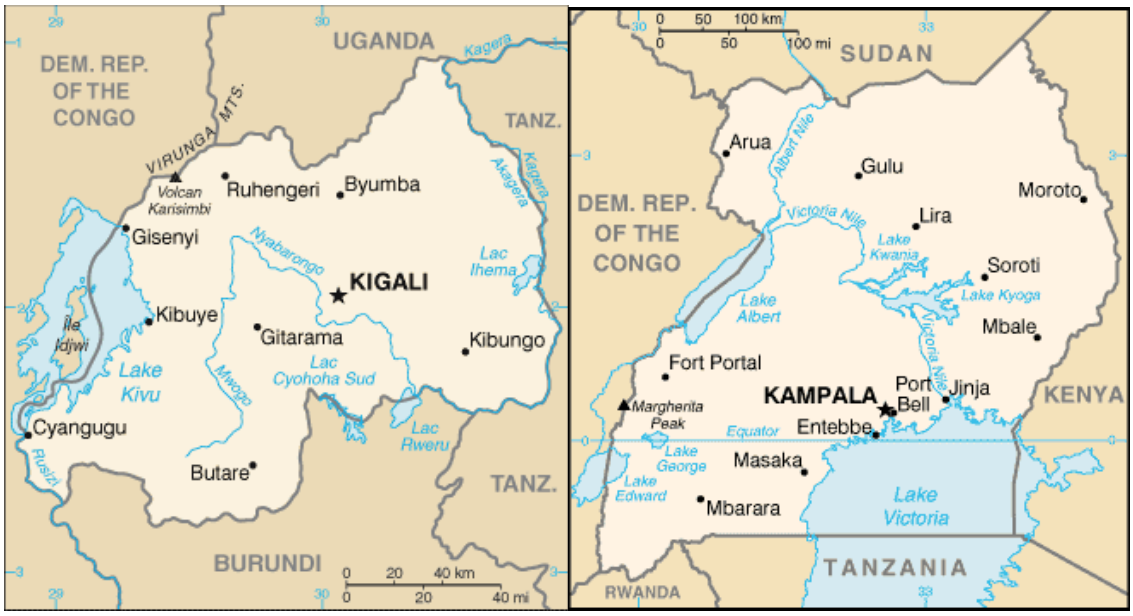


Figure 1. Boundary of the PoA: Rwanda (Left), Uganda (Right)

At the time of registration the Host Parties are Rwanda and Uganda. However, the PoA intends to expand to other host countries over time.

The boundary for each SSC CPA includes the physical, geographical sites of the low greenhouse gas emitting technologies for water purification installed by the project activity and the household/institutional buildings where the consumers of safe water provided by the systems are located

Leakage Emissions

Leakage relating to the non-renewable woody biomass is assessed as per the relevant procedures of AMS-I.E, as allowed by AMS-III.AV. The default value of 0.95 is applied to Emissions Reductions as per Equation 3 (see section B.6.1) to account for leakage.

A.6. Technologies/measures

As per the small-scale methodology *AMS-III.AV low greenhouse gas emitting safe drinking water production systems Version 4*, the technologies/measures employed under each CPA in the PoA are low carbon water purification technologies involving point-of-use (POU) or point-of-entry (POE) treatment systems[19] for household, community, and institutional applications. Institutional applications may include schools or prisons. Community applications may include restaurants, community centres, villages, offices, or health centres, i.e. applications with daily variable users.

Each system achieves the water quality defined in relevant national standards or international guidelines for drinking water quality. When possible, technologies that are produced locally will be chosen to promote local economic development. Technologies which use fossil fuels will not be included in the PoA.

There are a number of different types of water treatment interventions implemented under the PoA. The CME works with partners in each CPA to select the most appropriate technology for the region that also

[19] As defined in the methodology AMS-III.AV, Point of Use (POU) devices treat only the water intended for direct consumption, typically at a single tap or limited number of taps, while Point of Entry (POE) treatment devices are typically installed to treat all water entering a single home, business, school, or facility (USEPA, 2006).

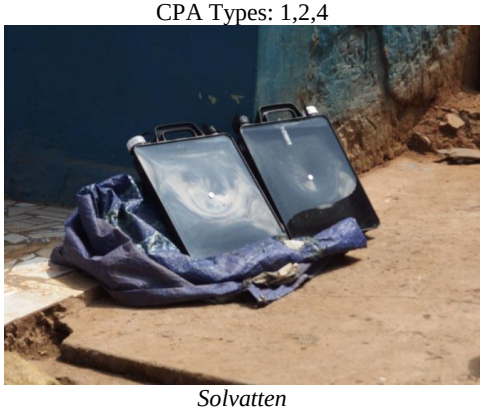
meets the PoA's eligibility criteria. Examples of low-carbon water purification technologies include, but are not limited to, the following:

- *Water filters*: filtration of water through ceramic, membrane, sand, activated carbon, etc. filter types
- *Solar disinfection devices:* heat treatment of water against microbial pathogens
- *Chemical disinfection:* use chemical(s) to disinfect water, such as chlorination
- *Ultrafiltration systems:* filtration through semipermeable membrane
- *Ultraviolet (UV) disinfection devices:* use UV light at sufficiently short wavelength to kill microorganisms; requires external power supply
- *Reverse osmosis systems:* use semipermeable membrane, applying pressure to overcome osmotic pressure

Table 1: Technology Types*

<table>
<tr>
<td>Water filters: e.g. ceramic, membrane, sand, activated carbon, etc
CPA Types: 1,2,4
 

Ceramji Ceramic pot filter;
Better Life Tulip filter</td>
<td>Solar disinfection devices

CPA Types: 1,2,4
 
Solvatten</td>
</tr>
<tr>
<td>Chemical disinfection (e.g. chlorination)

CPA Types: 1,2,4
 

WaterGuard</td>
<td>Ultra-filtration system

CPA Types: 2,4
 
Aquafilter Ultra-filtration</td>
</tr>
<tr>
<td>Ultraviolet (UV) disinfection device

CPA Types: 2,4 with solar panel
CPA types: 3,5 with other electricity source
 
Nandadeep UV System</td>
<td>Reverse Osmosis System

CPA Types: 3,5
  </td>
</tr>
</table>

*Note: pictured technologies represent examples of brands that may be used, however other brands may be included.

The aforementioned technologies may be allocated by CPA type as follows:

CPA type	Target User Group	Type of System	Technology
1	Households	POU	Water Filters Solar Disinfection Chemical Disinfection
2	Institutions	POU	Water Filters Solar Disinfection Chemical Disinfection

			Ultrafiltration devices Ultraviolet disinfection devices with renewable power
3	Institutions	POU with Project Emissions	Ultraviolet disinfection devices Reverse Osmosis systems
4	Community	POE	Water Filters Solar Disinfection Chemical Disinfection Ultraviolet disinfection devices with renewable power
5	Community	POE with Project Emissions	Ultraviolet disinfection devices Reverse osmosis systems

All technologies included in any CPA under the PoA will be suitable for use within the context of local water consumption practices and ensure that potable water is always available for household, institution, or community consumption.

A.7. Public funding of PoA

Any CPA that receives public funding from Annex 1 parties will confirm that it does not result in diversion of official development assistance.

SECTION B. Demonstration of additionality and development of eligibility criteria

B.1. Demonstration of additionality for PoA

Additionality of the PoA as a whole will be defined in the following sections. The additionality arguments laid out below will be confirmed via the eligibility criteria during the inclusion of a CPA. Additionality will be demonstrated through the '*Guidelines on the Demonstration of Additionality of Small-Scale Project Activities'* (Attachment A to Appendix B) (version 09.0).

The '*Guidelines on the Demonstration of Additionality of Small-Scale Project Activities'* (version 09.0) allows certain project activity types to be automatically additional without further need to demonstrate additionality. Paragraph 2(c) states that "Project activities solely composed of isolated units where the users of the technology/measure are households or communities or Small and Medium Enterprises (SMEs) and where the size[20] of each unit is no larger than 5% of the small-scale CDM thresholds" can be considered automatically additional.

In order to demonstrate compliance with these criteria for a CPA, the following will be checked via the eligibility criteria in the respective CPA-DD:

- The water purification system installed is operating as an isolated unit;
- The users of the water purification system are either households, institutions, or communities;
- Each water purification system achieves emissions reductions of less than 3,000 tCO2e per year.

Verifiable evidence will be provided for each of the above criteria to confirm compliance.

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

[20] That is the size of each unit is under 750 kW installed capacity or under 3000 MWh of energy savings per year or 3000 tonnes of emission reductions per year.

The eligibility criteria for inclusion of a CPA in the PoA are based on the *Standard for Demonstration of Additionality, Development of Eligibility Criteria and Application of Multiple Methodologies for Programme Activities* (version 03.0), Annex 05 of EB 74

The verifiable evidence presented in the 'CPA Indicator' column below is exemplary. The CPA implementer may choose which evidence to provide to confirm compliance with the eligibility criteria, and not all evidence provided in the column must be submitted as long as the evidence is sufficient to prove eligibility.

Criteria Number	Eligibility Criteria Category	Description	CPA Indicator
1	Location	All water purification systems in each CPA are located within the geographical boundaries of Rwanda or Uganda.	❑ [tick when met] _____ Verifiable evidence: – Geographical reference points of borders in section A.7 of the CPA-DD.
2	Double Counting	Each water purification system has a unique serial number and programme logo engraved or permanently attached as a nameplate or sticker. The serial numbers are listed in the CPA Project database and recorded in the Sales Receipt. [*and*] The name of each end-user (or individual who purchased product for institution or community center) will be recorded as part of the Sales Receipt and CPA Project Database. The address will be recorded if possible, alternatively other means of locating the device such as GPS can be used. [*and*] The CME has an agreement in place with owner of each individual water purification system in the CPA in which the owner transfers the rights to the emissions reductions exclusively to the CME as part of the Carbon Rights Waiver within the Sales Receipt. [*and*] The CME has an agreement in place with each technology supplier in which it is stated that the supplier transfers the rights to the emissions reductions of each water purification system exclusively to the CME.	❑ [tick when met] See Section C of the PoA-DD _____ Verifiable evidence: – Operations Manual, documented procedures. – Example of sales receipt/CRW – Agreement with technology supplier(s)

3	Technology	Each CPA will employ water purification systems that are point-of-use or point-of-entry treatment systems, and are in line with criterion 7). Technologies that use fossil fuels are not eligible. Each unit must achieve water quality defined in relevant national standards or international guidelines for drinking water quality. The technologies must meet minimum criteria for specific CPA type, as outlined below: *CPA type 1:Small-scale technologies for household consumption, no project emissions* - Minimum flow rate: 1 L/hr or one dose treating 5 l - Minimum capacity/lifespan: 4000 L or 1 year - Fixed or portable: Portable - Removal of E.coli: 99(2-log) - Minimum Watts/Voltage: N/A *CPA type 2:Technologies for institutional water consumption, no project emissions* - Minimum flow rate: 2 L/hr or one dose treating 5 l - Minimum capacity/lifespan: 8000 L or 1 year - Fixed or portable: Portable or Fixed - Removal of E.coli: 99 (2-log) - Minimum Watts/Voltage: N/A - Institutions included must lack access to reliable electricity supply. *CPA type 3: Technologies for institutional water consumption, with project emissions* - Minimum flow rate: 50 L/hr - Minimum capacity/lifespan: 219,000 L or 1 year - Fixed or portable: Fixed - Removal of E.coli: 99 (4-log) - Minimum Watts/Voltage: 5 *CPA type 4:Technologies for community water consumption, no project emissions* - Minimum flow rate: 1 L/hr or one dose treating 5 l - Minimum capacity/lifespan: 4000 L or 1 year - Fixed or portable: Portable or Fixed - Removal of E.coli: 99 (2-log) - Minimum Watts/Voltage: N/A - User must lack access to reliable electricity supply. *CPA type 5: Technologies for community water consumption, with project emissions* - Minimum flow rate: 50 L/hr - Minimum capacity/lifespan: 219,000 L or 1 year - Fixed or portable: Fixed - Removal of E.coli: 99 (4-log) - Minimum Watts/Voltage: 5	❑ [tick when met] _____ Verifiable evidence: – Technological specifications of technology

		-	
4	Start Date	Each CPA will prove that the start date of the CPA is on or after the start date of the PoA, which is stated in section D.1 of the PoA-DD. The start date of the CPA is the date on which the first water purification systems to be included in the CPA are ordered from the manufacturer. This is the earliest date at which real action of the program activity was taken, on which the CME committed expenditures related to implementation with the purchase of the first units for the project activity. This is documented in the purchase order or contract agreement with the technology supplier.	❑ [tick when met] _____ Verifiable evidence: – Purchase order to technology supplier – Contract with technology supplier
5	Methodology	Each CPA will apply the baseline and monitoring methodology AMS-III.AV (Version 4). The CPA will introduce water purification systems to provide safe drinking water to households, institutions and/or communities.	❑ [tick when met] _____ Verifiable evidence: – Technological specifications document(s) –
6	Methodology	Prior to the implementation of the project activity, a public distribution network of safe drinking water did not exist within the project boundary. If, during the crediting period, any users are provided with safe drinking water through a public distribution network, these users will be removed from the CPA. This will be monitored annually or at least biennially.	❑ [tick when met] _____ Verifiable evidence: – Feasibility study or – National reports or – Official publications (e.g. from WHO) or – Water quality Tests or – Interviews with public officials, NGOs, end-users

			–
7	Methodology	The water purification technology/equipment must achieve compliance with either: (a) a relevant national standard or (b) The interim performance targets as per "Evaluating household water treatment options: Health based targets and microbiological performance specifications" (WHO, 2011)	❑ [tick when met] _____ Verifiable evidence: – Laboratory test report and/or official notifications (e.g. from national authority on health). – Technical specifications document(s)
8	Methodology	In the case that the life span of water treatment technologies is less than the length of the crediting period, all users (or individual who purchased product for institution or community center) will be provided with the contact details (phone number, email address and name) of the CME/CPA Implementer from whom replacement systems can be obtained via the Sales Receipt. The contact information provided for the CME or CPA implementer is a mobile number which is registered to the company and should not change. However, if a change is made to the contact information, (a) all users (or individual who purchased product for institution or community center) for whom contact information was collected will receive notification via SMS with updated information and/or (b) upon calling the original mobile number, caller shall be redirected to the updated contact. At the time of sale, sales representative will explain that the user can contact the CME or CPA implementer at any time when they need to purchase a replacement system. With this information, users are ensured a means of accessing replacement purification systems of comparable quality.	❑ [tick when met] _____ Verifiable evidence: – Sales Receipt template
9	Additionality	Additionality of CPA shall be confirmed in line with the requirements of '*Guidelines on the Demonstration of Additionality of Small-Scale Project Activities'* (Attachment A to Appendix B) (version 09.0). In each CPA-DD it shall be demonstrated that: - the water purification system installed is operating as an isolated unit.	❑ [tick when met] _____ – Sales Receipt template for specifying user group

		- the users of the water purification systems are either households, institutions, or communities - the size of each unit is no larger than 5% of the small-scale CDM threshold or 3,000 tCO2e reduced per year	- Sales receipt template specifying user group - Emissions Reductions calculations spreadsheet demonstrating ERs per unit
10	Local Stakeholder Consultation	A local stakeholder consultation has been carried out for the CPA.	❑ [tick when met] Verifiable evidence: – Local stakeholder consultation report
11	Environmental impact analysis (EIA)	An environmental impact analysis (EIA) has been carried out for the CPA, or evidence is provided that the programme activities are exempt from an EIA.	❑ [tick when met] Verifiable evidence: – EIA report or – EIA exemptions notice from the government
12	Public Funding	A written confirmation from the CPA Implementer has confirmed that no funding from Annex 1 parties has been used for this CPA [or] If used, a written confirmation from the donor confirms that this did not result in a diversion of official development assistance (ODA).	❑ [tick when met] Verifiable evidence: – Written confirmation from CPA implementer – If funding from Annex I parties was used, written confirmation from donor that it did not result in a diversion of ODA
13	Target Group	The target group will be Households, institutions or communities, as defined by the CPA type: CPA type 1: Households	❑ [tick when met] Verifiable evidence:

		CPA types 2 and 3: Institutions CPA types 4 and 5: Communities Target group is recorded in the Sales Receipt, to be distributed according to mechanisms described in section A.2, including direct sales and sales through distribution partners.	– Operations Manual – Contract with CPA Implementer or distribution partner – Technology type
14	Sampling requirements	The sampling method applied in the CPA (e.g. in the monitoring plan) follows the *Standard for Sampling and Surveys for CDM Project Activities and Programme of Activities* (EB 74, Annex 6). A minimum 90% confidence interval and a 10% margin of error requirement is achieved for the sampled parameters. When a single sampling plan covers a group of CPAs or when monitoring is conducted biennially (every two years), confidence/precision of 95/10 for the sample size calculation is applicable.	❑ [tick when met] _____ Verifiable evidence: – Sampling plan
15	Size Limit	The CPA's annual emissions reduction in aggregate remains below the small-scale limit of 60,000 tCO_2e reduced per annum throughout the crediting period.	❑ [tick when met] _____ Verifiable evidence: – Emissions reduction calculation spreadsheet
16	De-Bundling	The proposed CPA of the PoA is not a debundled component of a large scale activity because: Each of the independent subsystems/measures included in the CPA of a PoA is no larger than 1% of the small-scale thresholds defined by the applied methodology (i.e. not exceeding 600tCO_2e for SSC type III methodologies).	❑ [tick when met] _____ Verifiable evidence: – Emissions reduction calculation spreadsheet

B.3. Application of methodologies

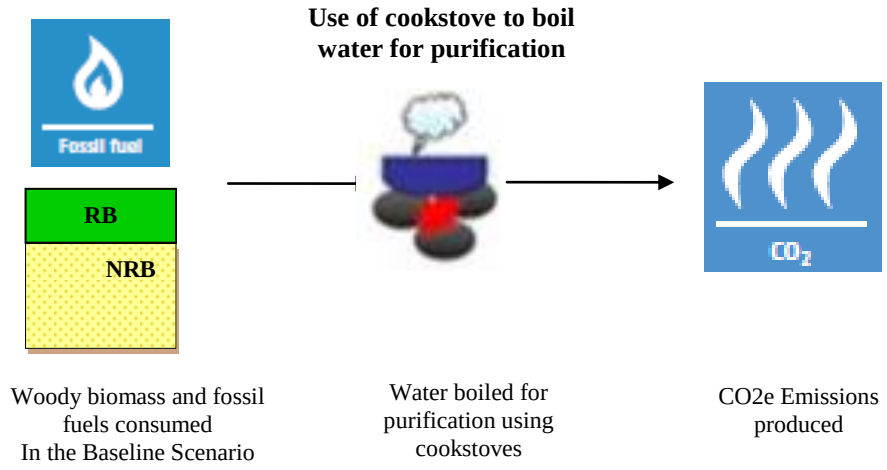
The PoA operates under *AMS-III.AV low greenhouse gas emitting safe drinking water production systems Version 4*.

CPAs under the PoA comprise the introduction of low greenhouse gas water purification systems to achieve water quality defined in relevant national standards or guidelines for drinking water quality. All technologies employed under the PoA are water purification technologies that involve point-of-use (POU) or point-of-entry (POE) treatment for household, institution, or community, applications, as defined in AMS-III.AV (version 4)The detailed monitoring requirements for each application will be defined at the CPA level.

The sampling plan for the PoA meets provisions in the sampling standard, described in Part II, Section B.7.2.

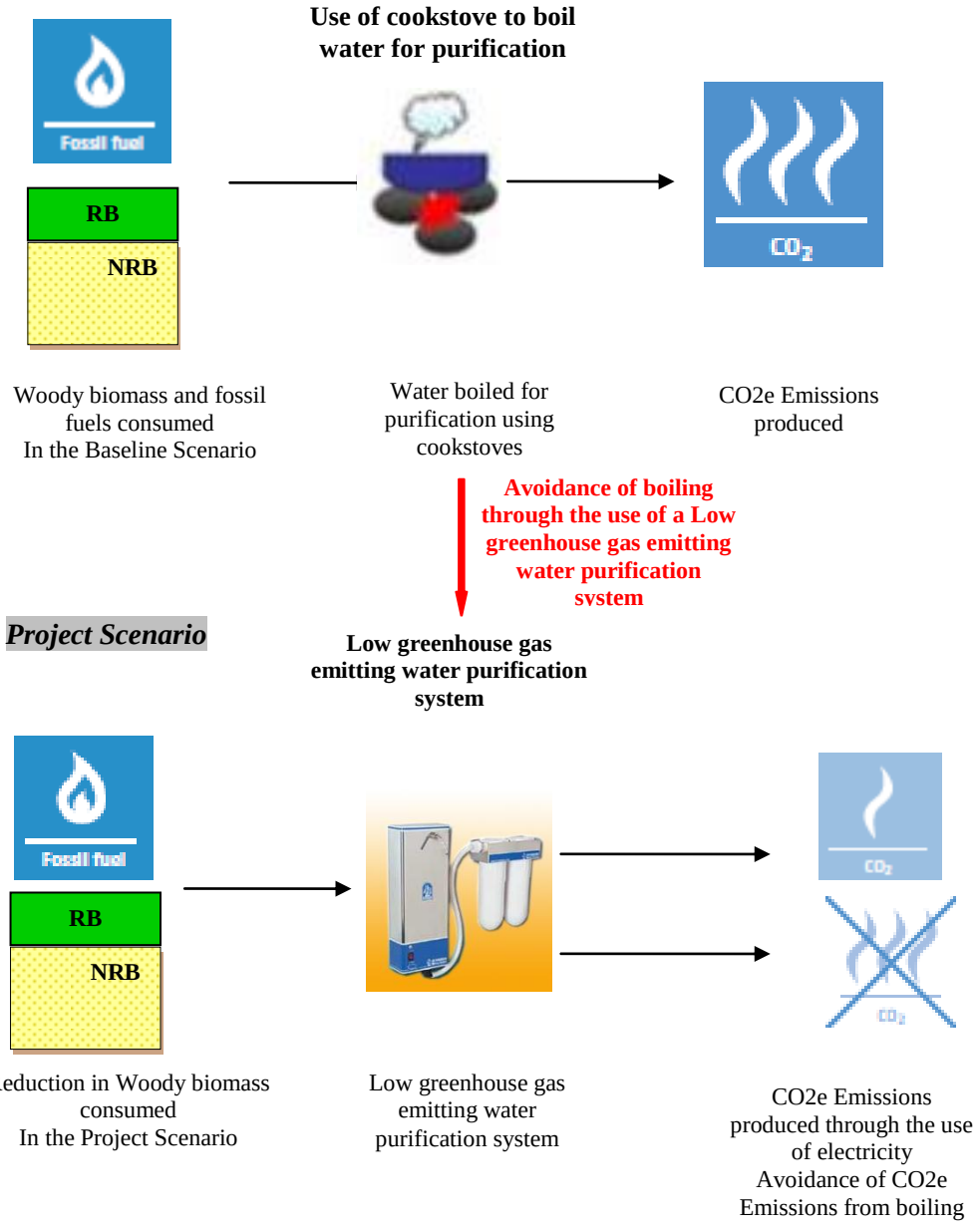
CPA type 1,2,4 Flow Diagram

Baseline scenario



CPA type 3 and 5 Flow Diagram

Baseline scenario


Use of cookstove to boil water for purification
Fossil fuel
RB
NRB
CO_2
Woody biomass and fossil fuels consumed In the Baseline Scenario
Water boiled for purification using cookstoves
CO2e Emissions produced
Avoidance of boiling through the use of a Low greenhouse gas emitting water purification svstem
Project Scenario
Low greenhouse gas emitting water purification system
Fossil fuel
RB
NRB
CO_2
CO_2
Reduction in Woody biomass consumed In the Project Scenario
Low greenhouse gas emitting water purification system
CO2e Emissions produced through the use of electricity
Avoidance of CO2e Emissions from boiling

For monitoring parameters, please refer to PoA-DD Part II, Section B.7.1

SECTION C. Management system

The CME manages the PoA as a whole. The management system is designed as per the *Standard for Demonstration of Additionality, Development of Eligibility Criteria and Application of Multiple Methodologies for Programme of Activities* (Version 03.0, EB 74 Annex 05), and includes all relevant information as per paragraph 19 therein.

The CME has also developed a CME Manual and an Operations Manual, with further details as to the management system of the PoA.

(a) A clear definition of roles and responsibilities of personnel involved in the process of inclusion of CPAs, including a review of their competencies;

The CME, Impact Carbon, will partner with CPA implementers to develop and implement CPAs that disseminate water purification systems and develop carbon assets in accordance to the registered PoA-DD and CDM requirements. The CPA implementer is responsible for communicating with WPS suppliers, ensuring that all stakeholders involved in CPA implementation are aware and have agreed that their contributions to project activities are part of the larger PoA. The roles and responsibilities of all parties involved in the PoA are shown below:

Entity	Core responsibility(s)	CDM responsibilities
Impact Carbon	Impact Carbon is the Coordinating/Managing Entity and is responsible for overall Programme execution and management, raising awareness, technological promotion, quality control, extension services, general monitoring and reporting. Tasks include: – Communication with internal personnel, operating partners and other stakeholders; overall project coordination. – Implement management and procedural changes if necessary. – Reviewing and continually improving performance of the PoA.	– Maintain a management system and record keeping database (Project Database) for each CPA under the PoA. – Issuing serial numbers to be applied to WPSs. – Request the UNFCCC to issue CERs into a registry account. – Continuously evaluate CPA implementer's performance in achieving projected emissions reductions. – Monitoring all CPAs, including drafting monitoring reports for all CPAs in accordance with the methodology AMS-III.AV – Coordinate/communicate with the validator/verifier and the UNFCCC Secretariat.
CPA Implementer	The CPA Implementer is the party that is in charge of realising a particular CPA. While this role can be performed by the Coordinating/Managing Entity, other parties can join the programme and set up new CPAs. Where this is the case, the	The CPA Implementer will be responsible for: – Collecting data to be monitored accurately, or training Field Measurement Personnel to do so. – Applying serial numbers to WPSs

Entity	Core responsibility(s)	CDM responsibilities
	CPA Implementer will be contractually bound to the CME to meet the requirements of the CDM, as detailed in the PoA-DD. The CPA Implementer will be responsible for coordinating the responsibilities of all entities involved in the CPA.	– Sharing monitored data with the CME – Manages CPA personnel training – Providing training to Sales Representatives regarding the operation of the CPA and document management process, including the information to be collected at sale of the water purification system (ie. Sales Receipt). – Maintains proper and continuous records of project activities and disseminated WPS, including technology identification – Oversees maintenance of installed project products
WPS Suppliers	Suppliers will be contractually bound by the CME to provide the following services within the programme: – Supply the water purification systems to the CPA Implementer.	– Ensuring that all water purification systems meet the quality standards outlined in the eligibility criteria for inclusion in the PoA.
Sales Representative	The Sales Representative is responsible for: – Instructing users on how to correctly use and maintain the water purification systems	– Correctly and accurately record all necessary user data in the Sales Receipt. – Instruct users how to contact the CME/CPA Implementer if a system requires maintenance or there is a problem. – Transfer data gathered at sale to the CPA Implementer for entry into the Project Database.
End users	– Purchasing the water purification systems – Using the water purification system correctly as an instructed during user training. – Alerting the CPA implementer when the water treatment is in need of maintenance/replacement. – Correctly and accurately provide information for completion of the Sales Receipt.	– The end user is made aware that by purchasing the technology they are waiving the rights to emission reductions generated by the use of the WPS to the CME. Possible mechanisms to demonstrate this to end users include signing Carbon Rights Waiver within the Sales Receipt, affixing a label to the units explaining the transfer of carbon rights, including an explanation of carbon rights waivers in the sales receipt, or verbally explaining the transfer of carbon rights.
Field measurement personnel	Field measurement personnel operate under the direction of the CPA Implementer, and will only be involved at the request of the CPA Implementer should their capacity be unable to carry	At the request of the CPA implementer, the field measurement personnel will be responsible for: – Assisting in collecting information to be monitored.

Entity	Core responsibility(s)	CDM responsibilities
	out all monitoring activities.	– Recording monitored data

At time of validation, Impact Carbon develops the generic design documentation for each available CPA type under the PoA. When proposing a new CPA for inclusion, the potential CPA implementer reviews the eligibility requirements and proposes the technology(ies) to be included in the CPA, including manufacturer specifications and target population, i.e. households, institutions, or communities.

The CME reviews the description of the technology to be employed under the CPA along with the certified efficiency. If the description is adequate and the certified efficiency above the required threshold and deemed authentic, the CME will consider the CPA for inclusion.

If the proposed technology and target group is deemed eligible, the CPA Implementer will develop CPA-DD using appropriate generic CPA-DD according to CPA type selected. The CME will conduct final review of eligibility of CPA, as outlined below in section (c).

Roles and responsibilities of personnel involved in process of CPA inclusion are described in table below:

Entity	**Role**	**Responsibility for CPA Inclusion Process**	**Relevant Competency**
CPA Implementer	Manager or appropriate personnel	- Proposes technology(ies) to be included in CPA - If approved, develops CPA-DD according to appropriate generic CPA type selected, with assistance from CME if required.	- Knowledge of technology(ies) - Understanding of implementation strategy and target users - Understanding of monitoring requirements
CME, Impact Carbon	Product Development Director	- Advises on inclusion activities in PoA - Conducts technical review of CPA-DD	- Knowledge and understanding of all CPAs with the PoA - Oversees project development and activities carried out by Program Manager
CME, Impact Carbon	Program Manager	- Manages development, implementation, quality and continuous improvement of PoA activities - Conducts initial review of eligibility of proposed technologies - Provides assistance in developing CPA-DD - Conducts initial review of eligibility criteria of CPA-DD	- Knowledge and relationship with all CPAs and Implementing Partners - Understanding of the PDD and all eligibility criteria - Understanding of the monitoring plan

(b) Records of arrangements for training and capacity development for personnel;

Impact Carbon management will be responsible for ensuring that PoA personnel have the knowledge and skills to effectively carry out project activities and achieve set goals for the PoA. It is the responsibility of the Program Manager to ensure that all required knowledge and skills are maintained within staff through reviews, evaluations, and training. It is the responsibility of the CPA Implementer to ensure that their staff have received the appropriate training and carry out their tasks correctly.

Induction training will be carried out for all new personnel involved in the PoA to ensure they have the core competencies required to participate in the PoA. Induction training will include:

- The structure and organization of the Impact Carbon Global Safe Water Programme of Activities and respective CPA(s)
- Introduction to the information management system, including the Project Database and the documentation management process (Figure)
- The importance of ensuring all critical tasks are completed in accordance with the CDM guidelines
- The nature of the project.

Records will be kept of all staff attending training via the Training Tracking Sheet, including the name of attendees, the organization and contact person hosting the training, the date, location and organization receiving training.

Management system training will be provided to all CPA Implementers by the CME, including:

- Details of the data to be entered into the Project Database How to complete and archive hardcopies of the Sales Receipt.
- Process of issuing, applying and reading serial numbers on the water purification systems
- Details of where to send copies of the project documentation
- Monitoring procedures in accordance with section B.7.2 of the Generic CPA-DD.
- Requirements to provide end user training on sale or distribution of WPS. User will be informed upon receipt of unit the proper method of use and maintenance. In case of institutions and community applications, the CPA implementer shall be instructed to train responsible individual(s) on use of the unit.

Upon completion of training the CPA Implementer will be issued with a letter confirming their attendance, including the name and contact details of those giving the training. Further details of training will be recording in the Training Tracking Sheet by the CME.

Training given to each party in the PoA are shown below:

Entity	Training to be given
CPA Implementer	– Induction training – Management system training – Procedures for ensuring each CPA meets the eligibility criteria of the PoA, and any documentation to be provided therein. – Procedures for sharing monitored data with the CME – How to provide training to Sales Representatives regarding the operation of the CPA.
Sales Representative	– How to complete and archive hardcopies of the Sales Receipt – Process of identifying and reading serial numbers – Details of where to send copies of the project documentation
End users	– How to use and maintain the water purification system (WPS) correctly – Procedure for dealing with the need for maintenance or any other problems with the WPS (contact CME/CPA Implementer on Sales Receipt)
Field measurement personnel	– Monitoring procedures in accordance with Part II, section B.7.2 of the Generic CPA-DD

(c) A procedure for technical review of inclusion of CPAs;

The CME shall ensure that all CPAs included under the PoA meet the eligibility criteria outlined in section B.2 of the PoA-DD for the specific CPA type and that the records of the technical review process are maintained. The technical review process for each CPA shall ensure that the criteria outlined in Section B.2 are met by the CPA.

Following the requirements stated in the "*Standard: Demonstration of additionality, development of eligibility criteria and application of multiple methodologies for Programme of Activities* (Version 3.0)" prior to the start of the inclusion process for a new CPA under the PoA, the proposed CPA-DD will be given a technical review by the Impact Carbon Program Manager or by a team of reviewers. The technical review shall check if the CPA-DD is drafted following the requirements of the Generic CPA and if the proposed CPA complies with the eligibility criteria stated in Section B.2. The reviewer(s) shall also check that the proposed CPA is neither registered nor being registered under another PoA, nor registered nor being registered as a standalone CDM Project Activity. The CME will also verify that no individual CDM project activity bearing the same name and covering the same scope as the proposed SSC-CPA is neither registered nor requesting registration.

For each proposed CPA the findings of the technical review will be presented to CME management for final approval. In the event that the conclusions of the technical review are not positive, the CPA Implementer will have to carry out the requested changes in its proposed CPA before re-submitting the project document for inclusion into PoA.

(d) A procedure to avoid double counting (e.g. to avoid the case of including a new CPA that has already been registered either as a CDM project activity or as a CPA of another PoA);

Each water purification system disseminated through this PoA shall have a unique serial number attached to ensure that double-counting does not occur. The serial number of each system will be recorded in the Project Database for the specific CPA alongside the name and address (where possible) of the users, where the database will not allow double entries of the serial number to be made. The serial numbers will also be recorded in hard-copy via the Sales Receipt.

The serial numbers are generated by the CME and sent to the CPA Implementer along with the sales invoice of the water purification systems shipped to the CPA Implementer. The design of the serial number ensures that the filter cannot be double counted within the PoA, while also clearly labeling it as belonging to this PoA, thus ensuring that it cannot be claimed by any other project. All users (or individual who purchased product for institution or community center) will also sign a Carbon Rights Waiver as part of the Sales Receipt acknowledging that they are not operating in any other carbon project and that emissions rights can be transferred to the CME. These data can be used by the CME and DOE to identify and locate each individual water purification system installed.

The CME may annually check the systems to ensure that:

- The recorded address/contact is correct for installed water purification systems for which information was collected ;
- The water purification systems are still operational (as part of the monitoring procedure);
- Serial numbers are unique and correspond with the numbers on the installed systems.

If the address/contact is found to no longer comply with the database *and* the user is found to be different to that listed in the Sales Receipt, the new user will be asked to sign and complete the Carbon Rights Waiver within a new Sales Receipt. All new details will be recorded in the database. Where the new user does not wish to sign a Carbon Rights Waiver, the system will be listed as no longer operational in the database (i.e. no further emissions reductions will be claimed).

There is one situation in which the address or serial number of the water purification system may change:

– A water purification system is moved to a different location. During receipt of the system, the user will have been directed to contact the Supplier should a system be moved. If the user is found to differ from that registered in the database the new address will be recorded in the database and a new Sales Receipt will be completed.

A record of old data will be kept alongside a description of the circumstances under which changes were made.

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

The operation of the Impact Carbon Safe Water Access Program will be carried out per the procedure outlined below:

Sale of water purification systems to end users

a) At sale of a water purification system, a Sales Representative completes the Sales Receipt with end-user information. If the unit is installed in an institution or community center, the sales receipt shall include end-user information of the individual who purchased product for institution or community center. The sales representative will provide the end-user with a copy of the receipt which will include an explanation of the carbon rights waiver, and contact details of the CME/CPA Implementer in case of any problems with the WPS or a change of address.
b) The end user will then sign the document confirming that their personal details are correct and that they approve the transfer of right to emissions reductions to the CME. One copy of the Sales Receipt is retained by the end user, the other is kept by the distributor.
c) A copy of the Sales Receipt is sent to the CPA Implementer's office, where details are entered into the Project Database Copies of all Sales Receipts will be scanned on an ongoing basis (depending on the quantity of distribution) and sent to the CME so that Impact Carbon can keep an electronic copy of all files. These scanned copies will be used to perform spot checks to ensure accurate data entry into the Project Database.
d) For self-installed household systems, operation will be confirmed ex-post during monitoring. However if additional support for installation of systems is needed, there will be a follow-up check to confirm installation of the WPS. For systems that are not self-installed, the CME will collect the Sales Receipt and an end-user signature when installation has been completed.

Stocking of Chemical Treatment for Chemical Units

1. Inventory for the purchase and shipment of chemical (such as chlorine) and subsequent refills to chemical units will be tracked to ensure that the unit have been sufficiently stocked with chemical for the duration of the crediting period.
2. The CME will work with the local implementer to make sure records are kept on file for these shipments.

All PoA information is stored centrally in the Project Database. The Project Database is populated with data collected during water purification system's sale to the end user through the documentation illustrated in Figure 2 above.

The **Sales Receipt** includes the following information:

– CPA identifier
– Contact details (name, organization, phone number and email) of the CME or CPA Implementer in case the water purification system requires maintenance, is moved to another address or transferred to another owner
– Address and contact details (name and phone number if available) of the end user (or individual who purchased product for institution or community center) if possible, alternatively other means of locating the water purification system such as GPS could be used
– Serial number

- Carbon Rights Waiver, in which the end user (or individual who purchased product for institution or community center) signs that they agree for rights to emissions reductions to be transferred to another user and that they are not participating in another carbon programme
- Date of installation
- Type of user (household, community, or institution)
- Technology type

The CME will operate a data management system that records information for each end-user via the Project Database. The data is collected by CPA Implementers or their retail partners and shared with the CME. The Project Database will be used to maintain project data for each CPA.

In addition, the CPA Implementer will be responsible for collecting annual monitoring data and sharing this with the CME. All information will be stored by the CME for at least two years after the end of the crediting period of the relevant project activity. The CME will prepare the monitoring report from the data collected and make the information available to the DOE during verification.

End users will be given contact information for the partner when receiving the unit via the Sales Receipt so that if units need repair or replacement the CPA Implementer can be contacted.

(f) Measures for continuous improvements of the PoA management system;

Impact Carbon is committed to continual improvement of the PoA. Tracking performance is critical to being able to effectively improve and provide consistent performance. Impact Carbon is committed to tracking performance throughout the life of the PoA and making necessary improvements to ensure effectiveness. Impact Carbon is committed to this both internally and with all partners involved in the POA.

In order to assess and improve the performance of PoA management and personnel, internal audits shall be conducted biennially. Audits shall review critical activities based on risk. Audits will produce timely and comprehensive Internal Audit Reports and System Improvement Requests that will be stored and managed by the CME and available for reference. The Program Manager will be responsible for ensuring that any corrective actions that result from an audit are effectively implemented.

SECTION D. Duration of PoA

D.1. Start date of PoA

The start date of the PoA is August 17th 2013 This is the date the PoA documents were uploaded for public comment and the start of the global commenting period.

D.2. Length of the PoA

The length of the PoA is 28 years.

SECTION E. Environmental impacts

E.1. Level at which environmental analysis is undertaken

The environmental analysis is undertaken at the PoA level, with analysis of the environmental impacts provided separately for Uganda and Rwanda. PoA and country level analysis is sufficient because all CPAs include the dissemination and use of water purification technologies, following SSC methodology AMS-III.AV (version 4). CPAs follow the same design, as laid out in Part II of the PoA-DD and are implemented within the same project boundaries by country.

E.2. Analysis of the environmental impacts

Rwanda: The CME received a letter from the Rwanda Development Board (RDB) indicating that the PoA does not require an Environmental Impact Assessment and that the RBD has assessed the possible environmental impacts of the project and has no objection to the implementation of the project. The RDB has required that all technologies be certified by the Rwanda Bureau of Standards (RBS), and that the CME elaborate on a waste management plan. The waste management plan has been provide to the DOE.

Uganda: The CME has received a letter from the National Environmental Management Authority (NEMA) granting the PoA an exemption of an Environment Impact Assessment. However the CME is requested to ensure end-users (or responsible individual for institution or community center) are trained as to proper usage of the technologies and to mitigate any unforeseen undesirable environmental impacts. The CME conducts in-person training and provides user manuals with each unit disbursed. When the CME is not responsible for distribution, the CME will make sure that all distribution partners (for households, institutions, and communities) are trained such that all customers will be provided with appropriate training upon receipt of the unit. Further, the CME has signed a statement declaring their intent to mitigate any unforeseen undesirable environmental impacts caused by the project.

SECTION F. Local stakeholder comments

F.1. Solicitation of comments from local stakeholders

The stakeholder meeting will be undertaken at the CPA level. Access to public drinking water varies across the PoA boundary. Conducting the stakeholder meeting at the CPA level allows for CPA specific comments to be incorporated.

F.2. Summary of comments received

Not Applicable

F.3. Report on consideration of comments received

Not Applicable

SECTION G. Approval and authorization

Letter of Approvals (LoA) from the Designated National Authorities of Rwanda and Uganda have been issued to the CME.

PART II. Generic component project activity

CPA type 1: Small-scale technologies for household water consumption, no project emissions

SECTION A. General description of a generic CPA

A.1. Purpose and general description of generic CPAs

The significant majority of households in [Host Country] lack access to potable water [add reference]. While many households do not treat their water at all, due to insufficient resources or lack of knowledge about the need, [X %], relying on boiling to provide their families with water that is drinkable [add reference]. With this practice pervasive throughout the country, the health and environmental impacts are widespread and severe: it results in significant greenhouse gas (GHG) emissions through the use of non-renewable fuelwood, causes deforestation, threatens biodiversity, and can create an economic hardship for families to access clean drinking water. Families that purify water through boiling are left vulnerable to

the negative effects of poor indoor air quality while those that do not boil, or only boil occasionally, suffer from waterborne diseases. Together, exposure to the harmful pollutants generated from traditional stoves and diseases induced from drinking non-treated water are responsible for over 5 million deaths globally per year, 1.5 million and 3.5 million respectively (WHO 2005;WHO 2008). In [Host Country] indoor air pollution contributed to [X] annual deaths and another [X] are caused by diarrheal diseases each year. [add reference] The purpose of this CPA is to provide access to clean water technologies that achieve water quality levels equivalent to boiled water.

The CPA Implementer, CME, and various local partners work together to distribute the following specific technologies to households within the CPA boundary of [specify boundary].

- Water Filters,
- Solar Disinfection systems,
- Chemical Disinfection,
- Ultraviolet disinfection devices with renewable power

The CME provides CPA implementers and local partners with access to clean water purification technologies. CPA implementers and partners leverage or create local distribution channels of [specify distribution channel, which may vary by CPA implementer, but may include direct sales,etc.] to reach households with water purification technologies. Carbon revenues are used to subsidize the cost of distribution and/or of the product.

The CPA Implementer adheres to the CME management system (Part I, section C of the PoA-DD) and provides the CME with information required to include the project activity under the PoA and perform monitoring and verification of the activity.

SECTION B. Application of a baseline and monitoring methodology

B.1. Reference of the approved baseline and monitoring methodology(ies) selected

The CPA operates under *AMS-III.AV low greenhouse gas emitting safe drinking water production systems,* (Version 4). The calculation of leakage refers to guidance from AMS-I.E. *Switch from non-renewable biomass for thermal applications by the user* (Version 5.0), as noted below.

B.2. Application of methodology(ies)

The CPA comprises the introduction of low greenhouse gas water purification systems to achieve water quality defined in relevant national standards or guidelines for drinking water quality. Since water purification systems are neither direct renewable energy (Type I) nor energy efficiency (Type II) application, under small scale methodologies these systems can be covered within Type III definition: "Type III: Other project activities that result in emission reductions of less than or equal to 60 kt CO_2 equivalent per year".[21] All technologies employed under the CPA are water purification technologies that involve point-of-use or point-of-entry treatment for residential or institutional technologies where end users of the subsystems or measures are households, communities, or SMEs, as defined in AMS-III.AV (Version 4). The methodology is applicable under a programme of activities as leakage is estimated using guidance from AMS-I.E, as noted is Section B.6. The applicability of the methodology is as follows:

Applicability condition	Demonstration of applicability
Prior to the implementation of the project activity, a public distribution network supplying safe drinking water (SDW) to the project boundary does not exist. If during the crediting period SDW is	This CPA is not in regions in [Host Country] where a public distribution network supplying safe drinking water exists. Compliance with this criterion shall be demonstrated for each CPA

[21] CDM Methodology Booklet 2012: https://cdm.unfccc.int/methodologies/documentation/meth_booklet.pdf

made available through a public distribution network, the emission reductions pertaining to the households/buildings supplied by the public system cannot be claimed from that point onwards. This condition should be checked annually during the monitoring period.	through national reports, official publications, government certification, monitoring of water quality, and/or a feasibility study. If such a system is introduced during the crediting period emissions reductions will not be claimed from the households/buildings supplied from that point onwards.
It shall be demonstrated based on laboratory testing or official notifications (for example notifications from the national authority on health) that the application of the project technology/equipment achieves compliance either with: (i) at a minimum the performance target as per "Evaluating household water treatment options: Health based targets and microbiological performance specifications" (WHO, 2011); or (ii) an applicable national standard or guideline	Each technology included in this CPA shall demonstrate compliance with either WHO's (2011) performance targets or an applicable national standard or guideline, at a minimum, by providing either laboratory testing documentation or an official notification of compliance.
In cases where the life span of the water treatment technologies is shorter than the crediting period of the project activity, there shall be documented measures in place to ensure that end users have access to replacement purification systems of comparable quality.	For technologies whose lifespan is less than the crediting period, each user will be provided with the contact details of the CME/CPA Implementer and instructed to contact them should they require a replacement system at any time during the crediting period. This forms part of the Sales Receipt.
Applicability of this methodology is foreseen in the following types of situations that shall be reassessed at the beginning of each crediting period: (a) Case 1: Project activities implemented in rural or urban areas of countries with proportion of rural or urban population using an improved drinking-water source equal to or less than 60 per cent confirmed by one of the three options below: (i) Proportion of populations using an improved drinking-water source for the most recent year for which data is available from WHO/UNICEF Joint Monitoring Programme (JMP) for Water Supply and Sanitation shall be used (<http://www.wssinfo.org/data-estimates/table/>) for this purpose. Definition of improved and unimproved drinking water source shall be as per the information provided by JMP; (ii) Using official data such as publicly available statistical data from a government agency or an independently commissioned study by an international organization or an university; (iii)_Using survey methods (use 90/10 confidence/precision for sampling); (b) Case 2: Project activities implemented in areas	[Reference surveys and/or studies to determine if the CPA falls under Case 1 or Case 2] This information shall be reassessed at the beginning of each crediting period.

not included in Case 1.	
The use of this methodology in a project activity under a programme of activities is legitimate if the leakage is estimated and accounted for as per the relevant provisions of AMS-I.E under the section for programme of activities.	Leakage relating to the non-renewable woody biomass is assessed as per the relevant procedures of AMS-I.E, as allowed by AMS-III.AV. The default value of 0.95 to account for leakage is used.

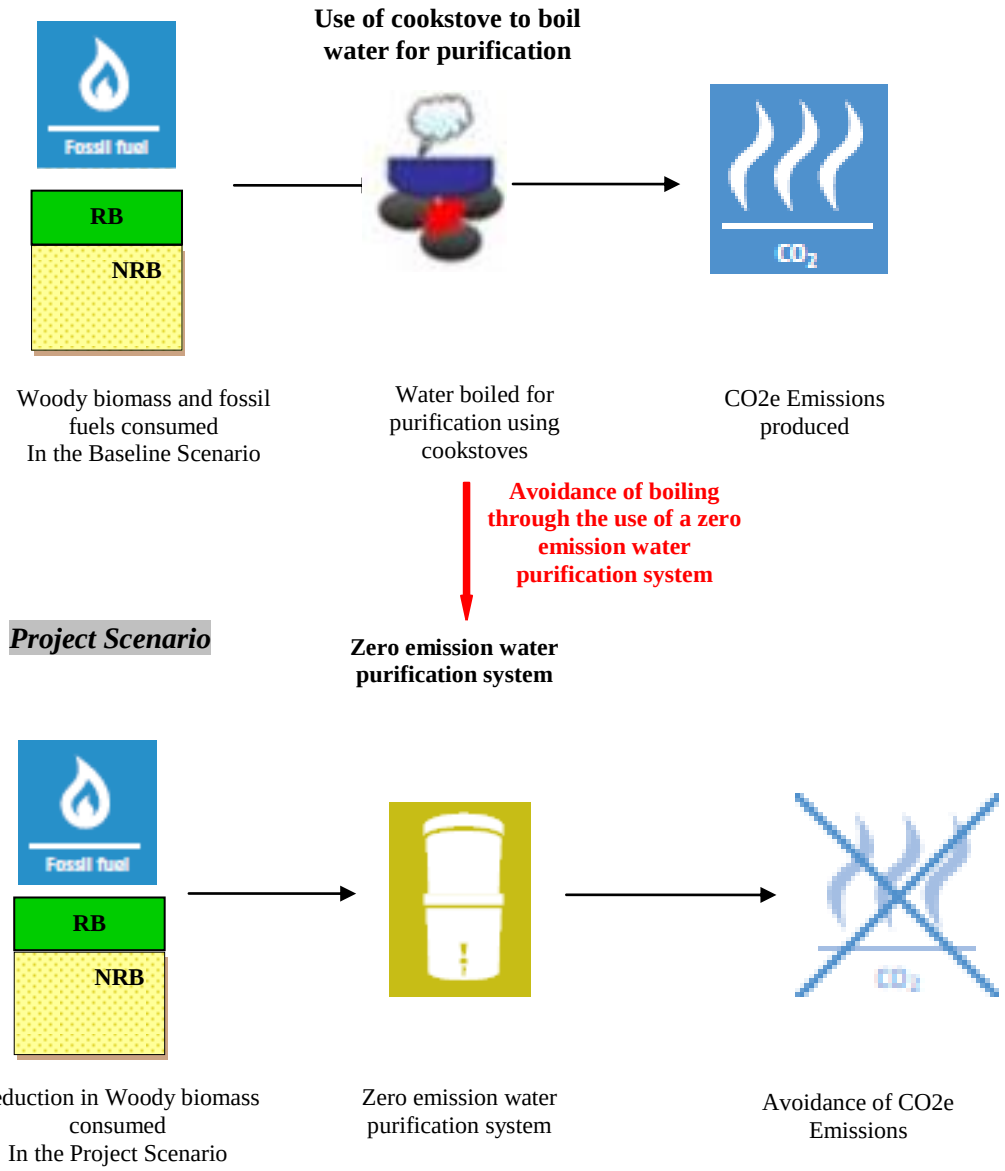
All applicability conditions are also included as eligibility criteria for the inclusion of this CPA under the PoA 'Impact Carbon Global Safe Water Programme of Activities'.

B.3. Sources and GHGs

The project boundary includes the physical, geographical sites of the low greenhouse gas emitting technologies for water purification installed by the project activity.

Source		Gas	Included?	Justification/Explanation
Baseline Scenario	Combustion of non-renewable biomass	CO_2	Yes	Major source of emissions
		CH_4	No	Minor source of emissions and limited data available. This is conservative.
		N_2O	No	Minor source of emissions and limited data available. This is conservative.
Project	Not applicable (no project emissions)	CO_2	No	N/A – no project emissions in CPA type 1
		CH_4	No	N/A – no project emissions in CPA type 1
		N_2O	No	N/A – no project emissions in CPA type 1

Flow Diagram



B.4. Description of baseline scenario

Following *AMS-III.AV low greenhouse gas emitting safe drinking water production systems* paragraph 2, each CPA shows that prior to the implementation of the project activity a public distribution network of safe drinking water does not exist within the total project boundary and safe drinking water, if any, is produced by consumers by only using point-of-use or point-of-entry water purifiers. [Include documentation that CPA does not operate in area with public distribution network of safe drinking water.]

As required under paragraph 3 of the methodology, the CPA provides or references surveys and/or studies to determine if the CPA falls under Case 1 or Case 2. This CPA falls under Case [X] [Reference appropriate surveys and/or studies for specific CPA.] The CPA also shows that [*target group*] within the CPA boundary purify water through boiling, using a variety of fuels including wood, charcoal and to a lesser extent, fossil fuels like LPG and kerosene. The combustion of fossil fuels and biomass result in the emission of GHGs, primarily carbon dioxide.

The baseline water boiling system for *[target population of CPA type]* is [explanation of typical baseline water boiling scenario for the target population]. [The CPA will also define access to improved water sources in the CPA boundary].

The simplified and standardized approach under the paragraph 11 of the methodology assumed that fossil fuel or non-renewable biomass (NRB) is used to boil water as a means of water purification. The fraction of non-renewable biomass (f_{NRB}) is established as per the relevant provisions of AMS-I.E. Annex 22 of EB 67 *Information Note: Default Values of Fraction of Non-Renewable Biomass for Least Developed Countries and Small Island Developing States* provides default f_{NRB} values as per AMS-I.E. For [Host Country], the default value is [value]. A default value of 1.0 will be used for non-renewable fossil fuels as per paragraph 6 of AMS-III.AV (Version 4).

B.5. Demonstration of eligibility for a generic CPA

The eligibility criteria for inclusion of a CPA in the PoA are based on the *Standard for Demonstration of Additionality, Development of Eligibility Criteria and Application of Multiple Methodologies for Programme Activities* (Version 02.1), Annex 05 of EB 70.

The verifiable evidence presented in the 'CPA Indicator' column below is exemplary. The CPA implementer may choose which evidence to provide to confirm compliance with the eligibility criteria, and not all evidence provided in the column must be submitted as long as the evidence is sufficient to prove eligibility.

Criteria Number	Eligibility Criteria Category	Description	CPA Indicator
1	Location	All water purification systems in each CPA are located within the geographical boundaries of Rwanda or Uganda.	❑ [tick when met] _____ Verifiable evidence: – Geographical reference points of borders in section A.7 of the CPA-DD.
2	Double Counting	Each water purification system has a unique serial number and programme logo engraved or permanently attached as a nameplate or sticker. The serial numbers are listed in the CPA Project database and recorded in the Sales Receipt. [*and*] The name of each end-user will be recorded as part of the Sales Receipt and CPA Project Database. The address will be recorded if possible, alternatively other means of locating the unit such as GPS can be used. [*and*] The CME has an agreement in place with owner of each individual water purification system in the CPA in which the owner transfers the rights to the emissions reductions exclusively to the CME as part of the Carbon Rights Waiver within the Sales Receipt. [*and*]	❑ [tick when met] See Section C of the PoA-DD _____ Verifiable evidence: – Operations Manual, documented procedures. – Example of sales receipt/CRW – Agreement with technology supplier(s)

		The CME has an agreement in place with each technology supplier in which it is stated that the supplier transfers the rights to the emissions reductions of each water purification system exclusively to the CME.	
3	Technology	Each CPA will employ water purification systems that are point-of-use or point-of-entry treatment systems, and are in line with criterion 7). Technologies that use fossil fuels are not eligible. Each unit must achieve water quality defined in relevant national standards or international guidelines for drinking water quality. The technologies must meet criteria for specific CPA type, as outlined below: *CPA type 1:Small-scale technologies for household consumption, no project emissions* - Minimum flow rate: 1 L/hr or one dose treating 5 l - Minimum capacity/lifespan: 4000 L or 1 year - Fixed or portable: Portable - Removal of E.coli: 99(2-log) - Minimum Watts/Voltage: N/A	❑ [tick when met] _____ Verifiable evidence: – Technological specifications of technology
4	Start Date	Each CPA will prove that the start date of the CPA is on or after the start date of the PoA, which is stated in section D.1 of the PoA-DD. The start date of the CPA is the date on which the first water purification systems to be included in the CPA are ordered from the manufacturer. This is the earliest date at which real action of the program activity was taken, on which the CME committed expenditures related to implementation with the purchase of the first units for the project activity. This is documented in the purchase order or contract agreement with the technology supplier.	❑ [tick when met] _____ Verifiable evidence: – Purchase order to technology supplier – Contract with technology supplier
5	Methodology	Each CPA will apply the baseline and monitoring methodology AMS-III.AV (Version 4). The CPA will introduce water purification systems to provide safe drinking water to households, institutions and/or communities.	❑ [tick when met] _____ Verifiable evidence: – Technological specifications document(s) –
6	Methodology	Prior to the implementation of the project activity, a public distribution network of safe drinking water did not exist within the project boundary. If, during the crediting period, any users are provided with safe drinking water through a public distribution network, these users will be removed from the CPA.	❑ [tick when met] _____ Verifiable evidence: – Feasibility study or – National reports or

		This will be monitored annually or at least biennially.	– Official publications (e.g. from WHO) or – Water Quality Tests or – Interviews with public officials, NGOs, end-users –
7	Methodology	The water purification technology/equipment must achieve compliance with either: (a) a relevant national standard or (b) The interim performance targets as per "Evaluating household water treatment options: Health based targets and microbiological performance specifications" (WHO, 2011)	❑ [tick when met] _____ Verifiable evidence: – Laboratory test report and/or official notifications (e.g. from national authority on health). – Technical specifications document(s)
8	Methodology	In the case that the life span of water treatment technologies is less than the length of the crediting period, all users will be provided with the contact details (phone number, email address and name) of the CME/CPA Implementer from whom replacement systems can be obtained via the Sales Receipt. The contact information provided for the CME or CPA implementer is a mobile number which is registered to the company and should not change. However, if a change is made to the contact information, (a) all users (or individual who purchased product for institution or community center) for whom contact information was collected will receive notification via SMS with updated information and/or (b) upon calling the original mobile number, caller shall be redirected to the updated contact. At the time of sale, sales representative will explain that the user can contact the CME or CPA implementer at any time when they need to purchase a replacement system. With this information, users are ensured a means of accessing replacement purification systems of comparable quality.	❑ [tick when met] _____ Verifiable evidence: – Sales Receipt template
9	Additionality	Additionality of CPA shall be confirmed in line with the requirements of '*Guidelines on the Demonstration*	❑ [tick when met] _____

		of Additionality of Small-Scale Project Activities' (Attachment A to Appendix B) (Version 09.0). In each CPA-DD it shall be demonstrated that: - the water purification system installed is operating as an isolated unit. - the users of the water purification systems are households - the size of each unit is no larger than 5% of the small-scale CDM threshold or 3,000 tCO2e reduced per year	– Sales Receipt template for specifying user group - Sales receipt template specifying user group - Emissions Reductions calculations spreadsheet demonstrating ERs per unit
10	Local Stakeholder Consultation	A local stakeholder consultation has been carried out for the CPA.	❑ [tick when met] _____ Verifiable evidence: – Local stakeholder consultation report
11	Environmental impact analysis (EIA)	An environmental impact analysis (EIA) has been carried out for the CPA, or evidence is provided that the programme activities are exempt from an EIA.	❑ [tick when met] _____ Verifiable evidence: – EIA report or – EIA exemptions notice from the government
12	Public Funding	A written confirmation from the CPA Implementer has confirmed that no funding from Annex 1 parties has been used for this CPA [or] If used, a written confirmation from the donor confirms that this did not result in a diversion of official development assistance (ODA).	❑ [tick when met] _____ Verifiable evidence: – Written confirmation from CPA implementer – If funding from Annex I parties was used, written confirmation from donor that

			it did not result in a diversion of ODA
13	Target Group	The target group will be households (CPA Type 1). Target group is recorded in the Sales Receipt, to be distributed according to mechanisms described in section A.2, including direct sales and sales through distribution partners.	❑ [tick when met] _____ Verifiable evidence: – Operations Manual – Contract with CPA Implementer or distribution partner – Technology Type
14	Sampling requirements	The sampling method applied in the CPA (e.g. in the monitoring plan) follows the *Standard for Sampling and Surveys for CDM Project Activities and Programme of Activities* (EB 74, Annex 6). A minimum 90% confidence interval and a 10% margin of error requirement is achieved for the sampled parameters. When a single sampling plan covers a group of CPAs or when monitoring is conducted biennially (every two years), confidence/precision of 95/10 for the sample size calculation is applicable.	❑ [tick when met] _____ Verifiable evidence: – Sampling plan
15	Size Limit	The CPA's annual emissions reduction in aggregate remains below the small-scale limit of 60,000 tCO_2e reduced per annum throughout the crediting period.	❑ [tick when met] _____ Verifiable evidence: – Emissions reduction calculation spreadsheet
16	De-Bundling	The proposed CPA of the PoA is not a debundled component of a large scale activity because: Each of the independent subsystems/measures included in the CPA of a PoA is no larger than 1% of the small-scale thresholds defined by the applied methodology (i.e. not exceeding 600tCO_2e for SSC type III methodologies).	❑ [tick when met] _____ Verifiable evidence: – Emissions reduction calculation spreadsheet

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

B.6.1. Explanation of methodological choices

The following equations and methodological choices shall be applied for calculating baseline emissions, project emissions, leakage emissions, and emission reductions to each generic CPA as per the methodology AMS-III.AV, Version 04:

Baseline emissions shall be calculated as follows:

$$BE_y = QPW_y \times SEC \times f_{NRB,y} \times EF_{projected\_fossilfuel} \times 10^{-9}$$ Equation (1)

Where:

BE_y	Baseline emissions during the year *y* in (tCO_2e)
QPW_y	Quantity of purified water in year *y* (Liters/yr). Calculation of QPW_y is demonstrated in Equations (1.a) and (1.b) below.
SEC	Specific energy consumption required to boil one litre of water (kJ/L) Calculation of SEC is demonstrated in Equation (2) below.
$f_{NRB,y}$	Fraction of woody biomass used in the absence of the project activity in year y that can be established as non-renewable. For biomass, the default values of f_{NRB} shall be used from EB67. A survey, national, or regional data is conducted to determine the mix of fuels (% of biomass, % of other fuels) used in the baseline. If a mixture of biomass and other fuels (e.g. fossil fuels) are used, a weighted average renewability factor shall be applied.
$EF_{projected\_fossilfuel}$	Emission factor when NRB is displaced or the emission factor of the fossil fuel substituted Default emission factors from AMS-I.E as referenced in AMS-III.AV version 4 and IPCC (2005) shall be used. A survey, national, or regional data is conducted to determine the mix of fuels (% of biomass, % of other fuels) used in the baseline. If a mixture of woody biomass and fossil fuels are used in the absence of the project activity a weighted average value shall be applied, as described in parameter box in section B.7.1

The quantity of purified water in year *y* (QPW_y) shall be calculated using Equation (1.a) for Case 1 and Equation (1.b) for Case 2 as demonstrated below. These equations follow paragraph 11 of the methodology that allows project participants to determine the amount of purified water and the amount of drinking water per person per day based on:

> (a) the population serviced by the project equipment, estimated using surveys and (b) an average volume of drinking water per person per day estimated using surveys or official data or peer reviewed literature or local expert opinion (a value of 5.5 litres per person per day shall not be exceeded). For Case 2, total project population needs to be adjusted for the fraction of the population serviced by the project equipment at households/buildings for which it can be demonstrated through documentation or survey that the practice of water purification would have been water boiling. (AMS-III.AV, version 4, para.11)

Case 1:

$$QPW_y = \sum_0^i (T_{y,i} \times N_{y,i} \times R_{y,i} \times 365 \times Water\ Quality_i \times Operational\ Units_i)$$

Equation (1.a)

QPW_y is the sum of the quantity of purified water for drinking for all technologies type *i*.

Where:

$T_{y,i}$	Total distributed water purification systems (number of units). The product of $T_{y,i}$ and $N_{y,i}$ represents "(a) the population serviced by the project equipment"
$N_{y,i}$	The average population serviced by water purification systems (person/equipment) The product of $T_{y,i}$ and $N_{y,i}$ represents "(a) the population serviced by the project equipment"
$R_{y,i}$	Average volume of drinking water per person per day (Liters/person/day) $R_{y,i}$ represents "(b) an average volume of drinking water per person per day."
Water Quality$_i$	Percent of units that meet water quality requirements *Water Quality*$_i$ parameter is used to modify $T_{y,i}$ such that only the proportion of units that meet required water quality standards out of the total sampled units shall be applied in calculation of QPW_y.
Operational Units$_i$	Percent of the monitoring period in which the units are in use *Operational Units*$_i$ parameter is used to modify $T_{y,i}$, such that only such that only the mean proportion of the monitoring period that the units are in use shall be applied in calculation of QPW_y. If multiple technology types are included, monitoring would measure parameter for each type of technology separately, as explained in monitored parameters section B.7.1.

Case 2:
For CPAs that fall under Case 2 (e.g. more than 60% of the target population have access to clean drinking water), ex-ante surveys are undertaken to establish the proportion of total population for which the common practice of water purification is or would have been water boiling, per paragraph 11 of the methodology.

$$QPW_y = \sum_0^i (X_{boil} \times T_{y,i} \times N_{y,i} \times R_{y,i} \times 365 \times Water\ Quality_i \times Operational\ Units_i)$$

Equation (1.b)

Where:

$X_{boil,i}$	The proportion of total population for which the common practice of water purification is or would have been water boiling (percentage) Parameter is required to adjust for the fraction of the population serviced by the project equipment at households/buildings for which it can be demonstrated through documentation or survey that the practice of water purification would have been water boiling, as stated in the methodology. Ex-ante surveys are undertaken to establish this value.
$T_{y,i}$	Total distributed water purification systems (number of units). The product of $T_{y,i}$ and $N_{y,i}$ represents "(a) the population serviced by the project equipment"
$N_{y,i}$	The average population serviced by water purification systems (person/equipment) The product of $T_{y,i}$ and $N_{y,i}$ represents "(a) the population serviced by the project equipment"
$R_{y,i}$	Average volume of drinking water per person per day (Liters/person/day) $R_{y,i}$ represents "(b) an average volume of drinking water per person per day"
Water Quality$_i$	Percent of units that meet water quality requirements *Water Quality*$_i$ parameter is used to modify $T_{y,i}$ such that only the proportion of units that meet required water quality standards out of the total sampled units shall be applied in calculation of QPW_y.
Operational Units$_i$	Percent of the monitoring period in which the units are in use *Operational Units*$_i$ parameter is used to modify $T_{y,i}$, such that only such that only the mean proportion of the monitoring period that the units are in use shall be applied in calculation of QPW_y.

The specific energy consumption [SEC] required to boil one litre of water shall be calculated as follows:

$$SEC = \left[WH \times \left(T_f - T_i\right) + 0.01 \times WHE\right]/n_{wb} \qquad \text{Equation (2)}$$

Where:

WH	Specific heat of water (kJ/L ^oC)
T_f	Final temperature (^oC)
T_i	Initial temperature of water (^oC)
WHE	Latent heat of water evaporation (kJ/L)
η_{wb}	Efficiency of water boiling system being replaced (fraction) The CPA Implementer will provide information on the baseline technology (i.e. system

	being replaced) to determine the value for η_{wb}, the efficiency value of the water boiling system. The type of baseline water boiling system used by target population will be determined via survey or national data. The efficiency value for the system being replaced will be determined using the following default values from the methodology: **Baseline Water Boiling System** / **Default Efficiency Value** Unimproved biomass burning stove: 0.1 Other biomass burning stove: 0.2 Fossil fuel stove: 0.5 If more than one system is encountered, a weighted average of values will be applied.

Emissions Reductions shall be calculated using Equation (3) below. This equation is in line with methodology with incorporation of leakage as adjustment to baseline emissions and the application of PEy, as explained below.

$$ER_y = (BE_y \times L - PE_y)$$ Equation (3)

Where:

ER_y	Emissions reductions during the year *y* in tCO_2e
BE_y	Baseline emissions from the use of non-renewable biomass (NRB) to boil water as a means of water purification, calculated in Equation (1) above.
L	Leakage factor to account for non-renewable woody biomass (fraction). Leakage relating to the non-renewable woody biomass is assessed as per the relevant procedures of AMS-I.E, as allowed by AMS-III.AV. The default value of 0.95 is applied to account for leakage.
PE_y	Project emissions from onsite consumption of fossils or electricity due to the project activity. As CPA type does not use fossil fuels or electricity, PE_y is zero.

B.6.2. Data and parameters that are to be reported ex-ante

(Copy this table for each data and parameter.)

Data / Parameter	Case1 or Case 2
Unit	-
Description	Case 1 or Case 2: Project activities implemented in rural or urban areas of countries with proportion of rural or urban population using an improved drinking-water source is equal to or less than 60 % (Case1) or above 60% (Case2).
Source of data	Survey or literature (For survey sampling refer to the sampling section of the monitoring plan under B.7.2)
Value(s) applied	[Case 1 or Case 2]
Choice of data or Measurement methods and procedures	Case 1 and Case 2 will be determined using one of the three options below: (i) Proportion of populations using an improved drinking-water source for the most recent year for which data is available from WHO/UNICEF Joint Monitoring Programme (JMP) for Water Supply and Sanitation shall be used (<http://www.wssinfo.org/data-estimates/table/>) for this purpose. Definition of improved and unimproved drinking water source shall be as per the information provided by JMP; (ii) Using official data such as publicly available statistical data from a government agency or an independently commissioned study by an international organization or an university; (iii) Using survey methods (use 90/10 confidence/precision for sampling).
Purpose of data	Determination of Case 1 or Case 2 for baseline and opting for appropriate emission reductions calculations methods
Additional comment	-

[The following parameter, X_{boil}, will only be included if the CPA falls under Case 2.]

Data / Parameter	X_{boil}
Unit	Fraction
Description	The proportion of total population for which the common practice of water purification is or would have been water boiling.
Source of data	Survey or literature (For survey sampling refer to the sampling section of the monitoring plan under B.7.2)
Value(s) applied	Refer to specific CPA
Choice of data or Measurement methods and procedures	Ex-ante surveys or literature will measure this parameter.
Purpose of data	Calculation of Case 2 baseline emissions
Additional comment	Applicable only to Case 2

Data / Parameter	WH
Unit	Kj/L ^{o}C
Description	Specific Heat of Water
Source of data	Default Value from AMS-III.AV Version 4
Value(s) applied	4.186
Choice of data or Measurement methods and procedures	-
Purpose of data	Calculation of baseline emissions
Additional comment	-

Data / Parameter	T_f
Unit	^{o}C
Description	Final Temperature
Source of data	Default Value from AMS-III.AV Version 4
Value(s) applied	100
Choice of data or Measurement methods and procedures	-
Purpose of data	Calculation of baseline emissions
Additional comment	-

Data / Parameter	T_i
Unit	^{o}C
Description	Initial Temperature
Source of data	Default Value from AMS-III.AV Version 4
Value(s) applied	20
Choice of data or Measurement methods and procedures	-
Purpose of data	Calculation of baseline emissions
Additional comment	-

Data / Parameter	WHE
Unit	Kj/L
Description	Latent Heat of Water Evaporation
Source of data	Default Value from AMS-III.AV Version 4
Value(s) applied	2,260
Choice of data or Measurement methods and procedures	-
Purpose of data	Calculation of baseline emissions
Additional comment	-

Data / Parameter	L
Unit	-
Description	Leakage
Source of data	Default Value from AMS-I.E Version 5
Value(s) applied	.95
Choice of data or Measurement methods and procedures	Methodological default
Purpose of data	Calculation of leakage emissions
Additional comment	-

Data / Parameter	$R_{y,i}$
Unit	Liters/person/day
Description	Average volume of drinking water per person per day
Source of data	WHO, Minimum water quantity needed for domestic use in emergencies.
Value(s) applied	3.5
Choice of data or Measurement methods and procedures	Official data on the minimum 'survival' allocation for drinking water.
Purpose of data	Calculation of QPW_y Used in equation (1.a) or (1.b), see section D.6.1
Additional comments	Per the methodology, if the calculation of QPW_y is based on the average volume of drinking water per person per day, a value of 5.5 litres per person per day shall not be exceeded. Whilst the cap in the methodology is 5.5 L/person/day, the PoA applies an effective cap of 3.5 L/person/day in the case of household consumption, which is more conservative, and a more realistic figure of the quantity of water that would be used for drinking purposes. $N_{y,i}$ multiplied by $R_{y,i}$ shall not exceed the maximum output of the technology [per unit].

B.6.3. Ex-ante calculations of emission reductions

[In this section, each CPA-DD will demonstrate calculation of ex-ante emission reductions pertaining to the specific CPA and CPA type using the methodological equations demonstrated in section B.6.1 above. A generic tabulated emission reduction format is provided below.]

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

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

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

(Copy this table for each data and parameter)

QPW_y, the total volume of drinking water produced by technologies under the CPA is calculated through Equation (1.a) or Equation (1.b) in the PoA-DD document, therefore parameters $T_{y,i,}$, $N_{y,i,}$ and $R_{y,i}$ need to be monitored, a value of 5.5 litres per person per day shall not be exceeded.

Data / Parameter	QPW_y
Unit	Liters/yr
Description	Quantity of purified water in year *y* (litres)
Source of data	Calculation
Value(s) applied	Refer to specific CPA
Measurement methods and procedures	Calculated through Equation (1.a) or (1.b) For Case 1: $QPW_y = \sum_0^i (T_{y,i} \times N_{y,i} \times R_{y,i} \times 365 \times Water\ Quality_i \times Operational\ Units_i)$ For Case 2: $QPW_y = \sum_0^i (X_{boil} \times T_{y,i} \times N_{y,i} \times R_{y,i} \times 365 \times Water\ Quality_i \times Operational\ Units_i)$
Monitoring frequency	Annual or at least biennial as per the monitoring requirements in the methodology
QA/QC procedures	-
Purpose of data	Calculation of baseline emissions
Additional comments	-

Data / Parameter	$T_{y,i}$
Unit	Units
Description	Total distributed water purification systems
Source of data	Sales invoices database
Value(s) applied	Refer to specific CPA
Measurement methods and procedures	The total number of units by technology type and date deployed in each specific CPA is tracked in the in the Project Database, using Sales Receipts. All units distributed will be recorded. Any unit not recorded in the Project Database will not be credited for emission reductions
Monitoring frequency	Continuous
QA/QC procedures	Sales Database is cross-checked with paper records to ensure transparent and robust data. Replacement units will be captured in monitoring the number of *Operational Units*$_i$.
Purpose of data	Calculation of baseline emissions
Additional comments	-

Data / Parameter	$N_{y,i}$
Unit	Persons/unit
Description	The average population serviced by water purification systems
Source of data	Survey
Value(s) applied	Refer to Specific CPA
Measurement methods and procedures	The number of people using the unit will be monitored.
Monitoring frequency	At least biennial per the methodology.
QA/QC procedures	$N_{y,i}$ multiplied by $R_{y,i}$ shall not exceed the maximum output of the technology [per unit].
Purpose of data	Calculation of QPW_y and capping the treated water consumed at 5.5 litres per person per day per paragraph 6 of the methodology Used in equation (1.a) or (1.b), see section D.6.1
Additional comments	-

Data / Parameter	Water Quality$_i$
Unit	[proportion]
Description	Water quality measurement
Source of data	Sampling surveys
Value(s) applied	Refer to specific CPA
Measurement methods and procedures	Water Quality testing will be done on sample of units per each technology type. After samples are chosen, a dedicated water container will be taken to the location where the system is installed to take a sample of the cleaned water for testing using the appropriate testing technology. Water quality is defined in a relevant national standard or guidelines for drinking water quality. An indicator may be monitored to assess whether samples meet these requirements. In case a national standard / guideline for drinking water quality is not available, the interim performance targets as per "Evaluating household water treatment options: Health based targets and microbiological performance specifications" (WHO, 2011). Each unit is deemed to meet relevant standards or not. The parameter is a proportion of units of the specific technology type that meet standards out of the total units sampled.
Monitoring frequency	Annual or at least biennial as per the monitoring requirements in the methodology.
QA/QC procedures	As per the World Health Organizations Guidelines[22] it is more cost-effective and feasible to monitor indicator organisms such as E.coli. Monitoring of proxies such as E.coli, faecal coliform counts, chlorine levels may be used to assess water quality. Enumerators will be trained on proper testing procedures and the appropriate testing technology will be used.
Purpose of data	Eligibility criteria and Emission Reduction calculations Used in Equation (1.a) or (1.b) For Case 1: $QPW_y = T_y \times N_y \times R_y \times 365 \times$ *Water Quality* x *Operational Units* For Case 2: $QPW_y = X_{boil} \times T_y \times N_y \times R_y \times 365 \times$ *Water Quality* x *Operational Units*
Additional comments	-

Data / Parameter	Operational Units$_i$
Unit	-
Description	Monitoring to check the percentage of the monitoring period which units of each technology type are in use
Source of data	Sampling surveys
Value(s) applied	Refer to specific CPA

[22] WHO 'Guidelines for Drinking-water Quality, Fourth Edition
www.who.int/**water**_sanitation_health/publications/.../dwq_**guidelines**/ Page 41

Measurement methods and procedures	Surveys will be conducted on sample of units per each technology type. The survey will then determine what percentage of days of the monitoring period the unit is in use by the end user. The mean of the percentage of operational days of the monitoring period of the samples will be applied for the parameter for each technology type.
Monitoring frequency	At least once per verification or biennially as per the monitoring requirements in the methodology.
QA/QC procedures	In the case that the unique serial number is no longer visible enumerators will inquire as to the date of purchase of the unit to ensure that the unit is not a replacement. If the specific unit selected for monitoring has been replaced it will be marked as out of use and deemed to be operational for 0% of the relevant monitoring period. Enumerators will be trained as to proper procedures to assess the percentage of the monitoring period which the unit is used.
Purpose of data	Calculation of QPW_y Used in Equation (1.a) or (1.b), see section D.6.1
Additional comments	-

Data / Parameter	$f_{NRB,y}$
Unit	-
Description	Fraction of woody biomass used in the absence of the project activity in year *y* that can be established as non-renewable
Source of data	EB 67 Annex 22 Default Values for Fraction of Non-Renewable Biomass for Least Developed Countries and Small Island Developing States, combined with survey, national, or regional data to determine the percent of users using woody biomass and fossil fuel in the baseline scenario. If the displaced fuel is fossil fuel use the default value of 1.0. If a mixture of woody biomass and fossil fuels is used in the absence of the project activity a weighted average value should be used, using surveys or national data.
Value(s) applied	See Specific CPA
Measurement methods and procedures	The type of baseline fuel(s) used by target population will be determined via survey, national, or regional data. Parameter will be determined using the default values from EB67 Annex 22 for woody biomass and from the methodology for fossil fuels: If a mixture of woody biomass and fossil fuels is used in the absence of the project activity a weighted average value shall be applied, calculated through the following formula: $f_{NRB,y}$ = [Default f_{NRB} value] * [% of users using NRB] + [1.0] * [% of users using fossil fuels]
Monitoring frequency	Continuously or at least biennial as per the monitoring requirements in the methodology.
QA/QC procedures	Enumerators will be trained as to proper procedures to assess the baseline stove that is being or would have been used to boil water.
Purpose of data	Calculation of baseline emissions
Additional comment	Use of national data for the type of baseline fuel used is appropriate if the CPA covers the entire boundary of the host country. In case CPAs cover specific portions of the country, regional government data may be used to ensure more conservative and accurate representation of the target populations.

Data / Parameter	η_{wb}
Unit	Fraction
Description	Efficiency of water boiling system being replaced
Source of data	Default values as per AMS-III.AV combined with survey, national, or regional data to determine the percent of users using different types of water boiling systems in the baseline scenario.
Value(s) applied	See Specific CPA
Measurement methods and procedures	The type of baseline water boiling systems used by target population will be determined via survey, national, or regional data. Parameter will be determined using the following default values from AMS-III.AV: **Baseline Water Boiling System** / **Default Efficiency Value** Unimproved biomass burning stove (UBBS) / 0.1 Other biomass burning stove (OBBS) / 0.2 Fossil fuel stove (FFS) / 0.5 If more than one system is encountered, a weighted average value shall be applied, calculated through formula below: η_{wb} = [Default efficiency of UBBS] * [% of UBBS users] + [Default efficiency of OBBS] * [% of OBBS users] + [Default efficiency of FFS] * [% of FFS users]
Monitoring frequency	Continuously or at least biennial as per the monitoring requirements in the methodology.
QA/QC procedures	Enumerators will be trained as to proper procedures to assess the baseline stove that is being or would have been used to boil water.
Purpose of data	Calculation of baseline emissions
Additional comment	Use of national data to determine the proportion of people using each type of baseline water boiling system is appropriate if the CPA covers the entire boundary of the host country. In case CPAs cover specific portions of the country, regional government data may be used to ensure more conservative and accurate representation of the target populations.

Data / Parameter	$EF_{projected\_fossilfuel}$
Unit	tCO2/TJ
Description	Emission factor as per AMS-I.E procedures when NRB is displaced or the emission factor of the fossil fuel substituted
Source of data	AMS-I.E as referenced by AMS-III.AV Version 4 for f_{NRB} and IPCC default values for fossil fuels, combined with survey, national, or regional data to determine the percent of users using woody biomass and fossil fuel(s) in the baseline scenario.
Value(s) applied	See Specific CPA
Measurement methods and procedures	The type of baseline fuel used by target population will be determined via survey, national, or regional data. Parameter will be determined using the following default values from AMS-I.E as referenced by AMS-III.AV Version 4 and IPCC (2006): **Emission Factor for Baseline Fuels** / **Emissions Factor** / **Source** EF_{NRB} / 81.6 tCO2/TJ / AMS-I.E $EF_{NaturalGas}$ / 56.1 tCO2/TJ / IPCC In the PoA boundary of Rwanda and Uganda, the population uses either woody biomass or fossil fuel.[23,24] To apply a conservative estimate of CERs, all fossil fuel used is assumed to be Natural Gas as this fuel has the lowest emission factor. If a mixture of woody biomass and fossil fuels is used in the absence of the project activity a weighted average value shall be applied, calculated through the following formula: $EF_{projected\_fossilfuel}$ = [EF_{NRB}]*[% of users using NRB] + [$EF_{Natural\ Gas}$]*[% of users using Natural Gas] + [$EF_{Kerosene}$]*[% of users using Kerosene]
Monitoring frequency	Continuously or at least biennial as per the monitoring requirements in the methodology.
QA/QC procedures	Enumerators will be trained as to proper procedures to assess baseline fuel usage.
Purpose of data	Calculation of baseline emissions
Additional comment	Use of national data for the type of baseline fuel used is appropriate if the CPA covers the entire boundary of the host country. In case CPAs cover specific portions of the country, regional government data may be used to ensure more conservative and accurate representation of the target populations.

[23] Rwanda: Biomass Energy Strategy (BEST) Rwanda, RBESS, MININFRA, 2009
[24] Uganda: National Uganda National Household Survey 2009/2010

Data / Parameter	Existence of public distribution network of safe drinking water
Unit	-
Description	Existence of public distribution network of safe drinking water in year *y*
Source of data	Surveys and or updated credible national/local reports/letters/announcements in relation to the existence of water networks in the region
Value(s) applied	-
Measurement methods and procedures	Review of surveys or credible national/local reports/letters/announcements
Monitoring frequency	Annual or at least biennial as per the monitoring requirements in the methodology
QA/QC procedures	-
Purpose of data	Eligibility criteria
Additional comments	-

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

The monitoring procedures and sampling plan for the PoA is in-line with *AMS-III.AV low greenhouse gas emitting safe drinking water production systems* (Version 4) and the procedures outlined in paragraph 18 of the *Standard for Sampling and Surveys for CDM Project Activities and Programme of Activities* (EB 74, Annex 6), which refers to the *Guidelines for Sampling and Surveys for CDM Project Activities and Programme of Activities* (EB 75, Annex 8):

a) Sampling design
  (i) Objectives and Reliability Requirements
  (ii) Target population
  (iii) Sampling method
  (iv) Sample size
  (v) Sampling frame
b) Data to be collected
  (i) Field measurements
  (ii) Quality Assurance/Quality control
  (iii) Analysis
c) Implementation plan
d) Data Storage
e) Monitoring management

The above criteria are elaborated in the forthcoming paragraphs.

a) Sampling Design
Flexibility to apply cross-CPA sampling is critical for the feasibility of the proposed PoA due to the large number of CPAs envisaged. Cross-CPA sampling may only be conducted for CPAs of the same type to ensure homogeneity. The CME will define a sampling frame for each CPA type such that the homogeneity of the group can be expected to be sufficient to allow for cross-CPA sampling. The criteria for homogeneity across-CPAs per EB 75 Annex 8 are listed in section *(v) Sampling Frame* below. A sampling approach may be set in a CPA, but as additional CPAs are included the sampling approach may change to enable cross-CPA sampling.

As a rule, the most appropriate confidence/precision levels required by the methodology AMS-III.AV (Version 4) and the Sampling Standard will be applied whenever sampling is undertaken. According to

the Sampling Standard, 95/10 reliability is to be applied whenever sampling across a group of CPAs, which will typically be the case for this PoA. In the case of conducting CPA-specific sampling, the methodology AMS-III.AV (Version 4) requires 90/10 confidence/precision if annual sampling is applied, or 95/10 confidence/prevision if biennial (every two years) sampling is applied.

(i) Objectives and Reliability Requirements

The objective of the sampling effort will be to meet the monitoring requirements set forth in the methodologies AMS-III.AV (Version 4), as detailed in B.7.1 above. Monitoring will be carried out on an annual basis (or biennial for specific parameters when allowed by the methodology, see B.7.1.). As the PoA progresses and the number of CPAs increases, the sampling plan can apply to a group of CPAs as referred to in EB 75, Annex 8. This will be applicable to CPA types as long as homogeneity can be demonstrated. When homogeneity cannot be demonstrated the CME may monitor CPAs individually.
All monitoring shall be coordinated by the CME, Impact Carbon.

The parameters to be obtained by means of sampling are listed below:

Parameter	Estimated Parameter Value*
$N_{y,i}$	[#]
$Water\ Quality_i$	[0-100]%
$Operational\ Units_i$	[0-100]%
$f_{NRB,y}$	[% of population using NRB, combined with default values]
η_{wb}	[% of each type of baseline stove usage, combined with default values]
$EF_{projected\_fossilfuel}$	[% of each type of baseline fuel, combined with default values]

*See specific-CPA.

Note that parameters $f_{NRB,y}$, η_{wb}, and $EF_{projected\_fossilfuel}$ shall be determined through default values combined with survey, national, or regional data. In case survey is chosen, the sampling plan described below shall apply.

(ii) Target Population

The target population for the application of monitoring procedure will be the households in which water purification systems have been installed, as identified through the centralised record-keeping Project Database managed by the CME. The database will include a unique identification number of the unit and end-user information including the location of the household. CPAs will be grouped by CPA type, and only CPAs of the same type and located in the same country may be sampled together.

(iii) Sampling method

Simple random, stratified random, or multi-stage sampling will be applied in the PoA in line with the Guidelines for Sampling and Surveys for CDM Project Activities and Programme of Activities (EB 75, Annex 8). The CME will apply the multi-stage sampling if it is too costly to sample all smaller units within clusters.

(iv) Sample size

The sampling method, either simple random, stratified random sampling, or multi-stage sampling will be determined separately for each CPA, as described and justified below. The sample will be representative so that if multiple CPAs are grouped in the monitoring process the proportion of units sampled from each CPA will equal the proportion of total units in operation in the various CPAs, and 95/10 will be achieved for cross-CPA monitoring. If monitoring occurs on an annual basis for an individual CPA then any representative sampling will satisfy the 90/10 confidence/precision requirement. If monitoring occurs

every two years for an individual CPA then any representative sampling will satisfy the 95/10 confidence/precision requirement. If the required level of accuracy (confidence/precision) is not achieved, the sample size can be expanded.

1. Simple random sampling may be used for monitoring all of the sampled parameters when the following conditions exist (as outlined in the table below). Justification for the use of this approach for each parameter is provided in table below:

Parameter	Justification/Assumptions for Simple Random Sampling
$N_{y,i}$	One technology and target group type; Devices not widely dispersed geographically
Water Quality$_i$	One technology and target group type; Devices not widely dispersed geographically
Operational Units$_i$	One technology and target group; Devices not widely dispersed geographically
η_{wb}	Devices not widely dispersed geographically (technology type/target group not applicable as parameter refers to baseline scenario)
$f_{NRB,y}$	Same as η_{wb}
$EF_{projected\_fossilfuel}$	Same as η_{wb}

Sample size is determined for Proportional Values under simple random sampling using:

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

Where:

n = Sample Size
N = Total Number of Households
p = Expected proportion
1.645 = Represents the 90% confidence interval (1.96 represents the 95% confidence interval)
0.1 = Represents the 10% relative precision

Sample size is determined for a Mean Value under simple random sampling using:

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

Where:

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

Where:

n = Sample Size
N = Total Number of Households
mean = Mean
SD = Standard deviation
1.645 = Represents the 90% confidence interval (1.96 represents the 95% confidence interval)
0.1 = Represents the 10% relative precision

2. Stratified random sampling may be used when the following conditions exist (as outlined in the table below). Stratified sampling is used to account for differences in technologies and/or target groups within one CPA. In the case that one CPA has a single technology type, but multiple distinct target group, i.e. restaurants and villages, the strata would be the target group. Therefore the strata shall be the technology type and/or the target group.

Parameter	Justification/Assumptions for Stratified Random Sampling
$N_{y,i}$	Multiple technology types and/or target groups
Water Quality$_i$	Multiple technology types and/or target groups
Operational Units$_i$	Multiple technology types and/or target groups
η_{wb}	Multiple target groups only, stratification by technology type only is not applicable as parameter refers to baseline scenario
$f_{NRB,y}$	Same as η_{wb}
$EF_{projected\_fossilfuel}$	Same as η_{wb}

Sample size is determined for Proportional Values under stratified random sampling using:

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

Where: $V = \frac{SD^2}{\overline{p}^2} = \frac{\text{overall variance}}{\overline{p}^2}$ and $\overline{p}$ is the overall proportion.

Where:

n	= Total sample size
1.645	= Represents the 90% confidence interval (1.96 represents the 95% confidence interval)
0.1	= Represents the 10% relative precision

Where:

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

Where:

n_i	= Sample size of the i^{th} group, where i=1,..,k
g_i	= Size of the i^{th} group, where i=1,..,k
N	= Population total

Where:

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

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

Where:

p_i = Proportion for the i^{th} group, where i=1,…,k

Using above equations, the total sample size (n) is calculated. The total sample size must be divided into the sample size for each group, i.e. each technology type. This division of the total sample size is calculated through the following equation:

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

Sample size is determined for a Mean Value under stratified random sampling using:

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

Where:

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

Where:

n	Sample Size
N	= Total Number of Households
mean	= Mean
SD	= Overall Standard deviation
1.645	= Represents the 90% confidence interval (1.96 represents the 95% confidence interval)
0.1	= Represents the 10% relative precision

Where:

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

Where:

SD	= Weighted overall standard deviation
	(SD_i Standard Deviation of the i^{th} group where i=1…,k
g_a	= Size of the i^{th} group where i=1,…,k
N	= Population total

Where:

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

Where:

mean	= Weighted overall mean
m_i	= Mean of the i^{th} group where i=1,…,k

Using above equations, the total sample size (n) is calculated. The total sample size must be divided into the sample size for each group, i.e. each technology type. This division of the total sample size is calculated through the following equation:

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

In order to establish the sample size (the number of groups to be sampled) using the above formulas, the following parameters must be known:

– the total number of strata in the population
– the average units per strata
– an estimate of the proportion/mean
– an estimate of the variance within each strata

3. Multi-stage sampling may also be used when the following conditions exist (as outlined in the table below). Multi-stage sampling consists of selecting primary clusters units and sampling from the secondary sampling units. The primary sampling units shall be administrative clusters, i.e. district, region, county, or village [to be determined at specific CPA]. The secondary sampling unit shall be the units.

Parameter	Justification/Assumptions for Multi-stage Sampling
$N_{y,i}$	Devices widely dispersed geographically
Water Quality$_i$	Devices widely dispersed geographically
Operational Units$_i$	Devices widely dispersed geographically types
η_{wb}	Devices widely dispersed geographically – use same location for baseline
$f_{NRB,y}$	Same as η_{wb}
$EF_{projected\_fossilfuel}$	Same as η_{wb}

Sample size is determined for proportional values under multi-stage sampling using:

$$c \geq \frac{\frac{SD_B^2}{\overline{p}^2} \times \frac{M}{M-1} + \frac{1}{\overline{u}} \times \frac{SD_w^2}{\overline{p}^2} \times \frac{(\overline{N}-\overline{u})}{(\overline{N}-1)}}{\frac{0.1^2}{1.645^2} + \frac{1}{M-1} \times \frac{SD_B^2}{\overline{p}^2}}$$

Where:

c	Number of groups that should be sampled
M	Total number of groups in the population
$\overline{u}$	Number of units to be sampled within each group
$\overline{N}$	Average units per group
SD_B^2	Unit variance
SD_W^2	Average of the group variances
p	Overall proportion
1.645	Represents the 90% confidence interval (1.96 represents the 95% confidence interval)
0.1	Represents the 10% relative precision

Sample size is determined for mean values under multi-stage sampling using:

$$c \geq \frac{\left(\frac{SD_B}{Clustermean}\right)^2 \times \left(\frac{M}{M-1}\right) + \left(\frac{1}{u}\right) \times \left(\frac{SD_W}{Overallmean}\right)^2 \left(\frac{\overline{N}-u}{\overline{N}-1}\right)}{\left(\frac{0.1}{1.645}\right)^2 + \frac{1}{M-1}\left(\frac{SD_B}{Clustermean}\right)^2}$$

Where:

c	= Number of groups that should be sampled
M	= Total number of groups in the population
$\underline{u}$	= Number of units to be sampled within each group
$\overline{N}$	= Average units per group
SD_B	= Standard deviation between groups
SD_W	= Average within group standard deviation
Clustermean	= The cluster or group mean
Overall mean	= The average across all households
1.645	= Represents the 90% confidence required (1.96 for 95% confidence)
0.1	= Represents the 10% relative precision

The precision and expected variance is established in accordance with the recommended values by UNFCCC[25], namely 95% precision and 10% expected variance, for cross-CPA sampling.

In order to establish the sample size (the number of groups to be sampled) using the above formulas, the following parameters must be known:
- the total number of groups in the population
- the average units per group
- an estimate of the proportion/mean
- an estimate of the variance between and within groups

The sample size calculation will be automated in an Excel spreadsheet so that different scenarios may be estimated.

If the sample size calculation returns a value of less than 30 samples, a minimum of 30 samples will be conducted.

(v) Sampling frame

The sampling frame will be all units within a CPA, which will be derived from the sales database.
In the case of cross-CPA sampling, the sampling frame shall include all units distributed across multiple CPAs of the same CPA type if CPAs are considered homogenous. Samples will be selected from each sampling frame according to the estimates from using the sample size equations in EB 75 Annex 8. One or more criteria from the list below may be used to demonstrate homogeneity across CPAs, as per EB 75 Annex 8:

(a) Project technology/equipment have comparable input/output characteristics, including efficiency, and provide comparable service, e.g. water flow rates and filtration or disinfection mechanism are comparable;
(b) End users of the project technology/equipment have comparable socioeconomic conditions (e.g. middle class households);

[25] Standard for Sampling and Surveys for CDM Project Activities and Programme of Activities (EB 74, Annex 6).

(c) The geographic locations of project equipment do not have a significant influence on the parameter of interest, e.g. water filtration or disinfection systems installed in colder climates have different output rates than those in warm climates, in which case stratification of technologies by geographical area is desirable;
(d) Installation dates of the CPAs are not significantly different to considerably impact on the parameter of interest; for example the range of installation dates does not exceed the life span of the device.

b) Data to be collected

(i) Field measurements

Field measurement objectives and data to be collected are listed in section B.7.1. The parameters to be sampled within each CPA will depend on if the project activity is deemed to be Case 1 or Case 2, as outlined below.

For each CPA, the following parameters are determined through sampling:

a) $N_{y,i}$
b) $Water\ Quality_i$
c) $Operational\ Units_i$
d) η_{wb}
e) $f_{NRB,y}$
f) $EF_{projected\_fossilfuel}$

Parameters listed above will be obtained using sampling and will meet 90/10 confidence precision when sampled as a single CPA and 95/10 confidence and precision when sampled across CPAs or if monitoring is conducted on a biennial (every two years) basis.

For CPAs that fall under Case 2 (e.g. more than 60% of the target population have access to clean drinking water), ex-ante surveys are undertaken to establish:

g) X_{boil} - the proportion of total population for which the common practice of water purification is or would have been water boiling;

CPA monitoring draws on information from the electronic data management system. The CME will operate and manage an electronic data management system that will store information on and track all units under the PoA. The system will contain the following information:

- Volume of units disseminated under the PoA
- Technology type for each unit
- Unique identification number for each unit
- Name, address, and contact information of the end-user (where possible)
- Date of installation (where possible)
- CPA assignment

The date of installation for each unit is used to determine the portion of the monitoring period during which the unit was active. Products deployed under the project activity are assumed be in operation as of the start of the next month following the date of sale, i.e. if the date of sale is April 1st, the start of operation is May 1st.

Monitoring will ensure the water quality of the water treated by the products employed under each CPA, as required under AMS-III.AV (Version 4). It shall be demonstrated that the application of the project

technology/equipment achieves compliance with "protective"[26] or interim WHO performance targets as per "Evaluating households water treatment options: Health based targets and microbiological performance specifications" (WHO, 2011) or a comparable national standard or guideline. As per the World Health Organizations Guidelines,[27] it is more cost-effective and feasible to monitor indicator organisms such as E.coli. Monitoring of proxies such as E.coli, faecal coliform counts, chlorine levels may be used to assess water quality. Enumerators will be trained on proper testing procedures and the appropriate testing technology will be used.

Upon installation of the water purification units and associated accessories, the user (or individual who purchased product for institution or community center) will sign a Sales Receipt. For units that are not self-installed, a Sales Receipt will be signed upon commissioning. The sales and installation persons shall be responsible for ensuring that all data are complete and accurate within respective documents. Hard copies of both documents will be kept at the office of the CME, and all data entered into a central record keeping database.

The record keeping database will be used to record the results of all monitoring, thereby avoiding double counting, with all data stored to be kept for at least two years after the crediting period or the last issuance of CERs for the project activity. The data will be stored electronically in the database, with original hard copies of all collected monitoring data also kept.

(ii) Quality Assurance/Quality Control

Training will be given to sales staff of the CME or CPA implementer (if not the CME) responsible for the data collection system on the management system to be put in place as part of the overall PoA. This will include:

- Data to be recorded in the database (as per the Partner Operation Manual) and how to complete the Sales Receipt record correctly;
- How to identify the serial number on a water purification unit;
- How to fill out and where to submit copies of the sales contract, installation records and invoice and any associated documentation.

On completion of training, the name, company, and contact details of all attendees will be recorded. This will be used to confirm that the training has been completed and that staff is qualified to carry out the data collection as required under the PoA.

In order to minimise errors, a quality control and assurance strategy plan will be established. This strategy includes a planning phase in which there is a clear definition of the target population, of the issues and variables to be investigated, of the sampling frame and sample size, and the design of a questionnaire that reflects the objectives of the survey and facilitates field operations and information processing. The team who will carry out the sampling survey will be appropriately selected to have previous field experience in performing similar surveys.

In order to minimise errors, all personnel conducting field measurements, both for the collection of baseline data and annual monitoring of CPAs, on behalf of the programme will receive training on the procedures to be used for data collection, including the format in which data should be collected, project background, basic functioning of the water purification units, their application and any other relevant project background. Enumerators will also be trained as to best practices of survey implementation to

[26] Protective default performance target is defined by a 2 $\log_{10}$ reduction of bacteria, a 3 $\log_{10}$ reduction of viruses and a 2 $\log_{10}$ reduction of protozoa ("protective"). The reference pathogens shall be C. Jejuni, Cryptosporidium, and rotavirus.

[27] WHO 'Guidelines for Drinking-water Quality, Fourth Edition
www.who.int/**water**_sanitation_health/publications/.../dwq_**guidelines**/ Page 41

ensure that all bias is removed. Response rates will be maximised by contacting randomly-selected water purification units' users beforehand to arrange a practical site visit date and sampling over the minimum required number to compensate for any non-responses. In cases where participants refuse to participate in the monitoring, the reason shall be documented in the CME's programme database. Receipts will explain that project participants may be selected for monitoring and sales representatives will be encouraged to explain this to end users, in order to maximize responsiveness. The CME will explain that monitoring is part of the requirements of the programme and try to arrange an alternative date for a site visit, or carry out monitoring with another member of the household/SME/community. The programme database will have a provision for recording any monitoring carried out in reference to the serial number of the installed system.

Outliers will be defined as datapoints that are more than 1.5 times the inner quartile range. Outliers will be dealt with by applying the CDM materiality principles outlined in CMP7. That is, the outliers will be disregarded provided that doing so does not lead to an overestimation of the emissions reductions of a group of CPAs of higher than:

- 5% in the case of SSC-CPAs (CMP 7, Paragraph 4(d))

(iii) Analysis

Data will be used for the preparation of monitoring reports for each CPA or a group of similar CPAs. The results of all monitoring will be entered into the CME's management database. Where it is found that an installed water purification system is no longer in use, the installation will be removed from inclusion in the CPA.

(c) Implementation Plan

Impact Carbon is responsible for the production of annual monitoring reports, following the criteria outlined in section B.7 and B.7.1. Sampling will be carried out following the *Standard for Sampling and Surveys for CDM Project Activities and Programme of Activities* (EB 74, Annex 6) in accordance with CDM requirements. A precision/confidence of 95/10 will be applied for cross-CPA sampling, in accordance with the requirements of the methodologies above.

All sampling efforts will be conducted by qualified personnel who have undergone training as part of the programme. They will be issued with a certificate confirming their attendance at any training and their qualification to complete the monitoring. A paper copy of the certificate will also be kept by the CME. Any samplers will be required to speak the native language(s) in which water purification systems have been implemented, allowing for full understanding of any responses given by users, and any questions therein.

If sampling is to be carried out for a group of CPAs, monitoring may be carried out any time before the annual deadline for each CPA to be included in the sampling effort, and should be conducted annually thereafter. The date of all monitoring shall be recorded in the CPA database.

(d) Data storage

Project data to be collected will depend on the monitoring choices applied within each CPA based on if CPA is Case 1 or Case 2, as detailed above and in section B.7 and B.7.1.

All monitored data will be entered into the CME database. In case an error is made in data entry, original copies of all monitoring documents will be kept and filed per. The name, date, and contact details of the surveyor will be detailed on all completed monitoring surveys, therefore allowing for the follow-up of all incomplete/unclear data.

Hard copies of all documents will be kept at the office of Impact Carbon, or an alternative address nominated by them, and all data entered into a central record keeping database. The record keeping

database will be used to record the results of all monitoring, with all data stored to be kept for at least two years after the crediting period or the last issuance of CERs for the project activity.

(e) Monitoring Management

The responsibility for monitoring and reporting lies with the CME. Trained staff will be dedicated to carry out the monitoring process including data recording, reporting, archiving and management. The training will take place just before each CPA becomes operational. This is in order to ensure that the monitoring activity will take place exactly in accordance with the methodology and monitoring plan requirements and to guaranty a smooth verification and issuance process thereafter.

Entities responsible for conducting monitoring

Role	Responsibility
Project Development Director	- Receive escalated monitoring issues and questions from Water Programme Manager, clarify uncertainties in methodology, provide additional support from Project Development team if needed. Advises on monitoring issues.
Programme Manager	- Enlist and manage work of Third party monitoring – supply protocols, ensure timeframe is met, address issues, compile final reports, etc - Manages the Project Database, in which the results of monitoring shall be summarised. - Oversees and drafts the production of annual monitoring reports. - Coordinates communication with the verifier and the UNFCCC Secretariat
CPA Implementer	- Collecting data to be monitored accurately, or training Field Measurement Personnel to do so. - Sharing monitoring data with the Water Programme Manager (CME). - Maintains proper and continuous records of project activities and disseminated WPS, including unit identification - Oversees maintenance of installed systems
Programme Associate	- Assist with the completion of monitoring reports with input from the Water Programme Manager.
Field measurement personnel	- Conduct on the ground monitoring of end users
External QAQC	- Verify the monitoring work done to ensure accuracy before submission; review protocols, interview enumerators, spot check data

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PART II. Generic component project activity

CPA type 2: Technologies for Institutional water consumption, no project emissions

SECTION A. General description of a generic CPA

A.1. Purpose and general description of generic CPAs

The significant majority of institutions in [Host Country] lack access to potable water [add reference]. While many people do not treat their water at all, due to insufficient resources or lack of knowledge about the need, [X %], relying on boiling to purify water [add reference]. With this practice pervasive throughout the country, the health and environmental impacts are widespread and severe: it results in significant greenhouse gas (GHG) emissions through the use of non-renewable fuelwood, causes deforestation, threatens biodiversity, and can create an economic hardship for families to access clean

drinking water. Families that purify water through boiling are left vulnerable to the negative effects of poor indoor air quality while those that do not boil, or only boil occasionally, suffer from waterborne diseases. Together, exposure to the harmful pollutants generated from traditional stoves and diseases induced from drinking non-treated water are responsible for over 5 million deaths globally per year, 1.5 million and 3.5 million respectively (WHO 2005;WHO 2008). In [Host Country] indoor air pollution contributed to [X] annual deaths and another [X] are caused by diarrheal diseases each year. [add reference] The purpose of this CPA is to provide access to clean water technologies that achieve water quality levels equivalent to boiled water.

The CPA Implementer, CME, and various local partners work together to distribute the following specific technologies to institutions within the CPA boundary of [specify boundary].

- Water Filters,
- Solar Disinfection,
- Chemical Disinfection,
- Ultraviolet systems with renewable power (such systems shall only be installed in institutions that lack access to reliable energy supply)

The CME provides CPA implementers and local partners with access to clean water purification technologies. CPA implementers and partners leverage or create local distribution channels of [specify distribution channel, which may vary by CPA implementer, but may include direct sales, etc.] to reach institutions to distribute water purification technologies. Carbon revenues are used to subsidize the cost of distribution and/or marketing of the product.

The CPA Implementer adheres to the CME management system (section C of the PoA-DD) and provides the CME with information required to include the project activity under the PoA and perform monitoring and verification of the activity.

SECTION B. Application of a baseline and monitoring methodology

B.1. Reference of the approved baseline and monitoring methodology(ies) selected

See Section B.1 in Generic CPA 1.

B.2. Application of methodology(ies)

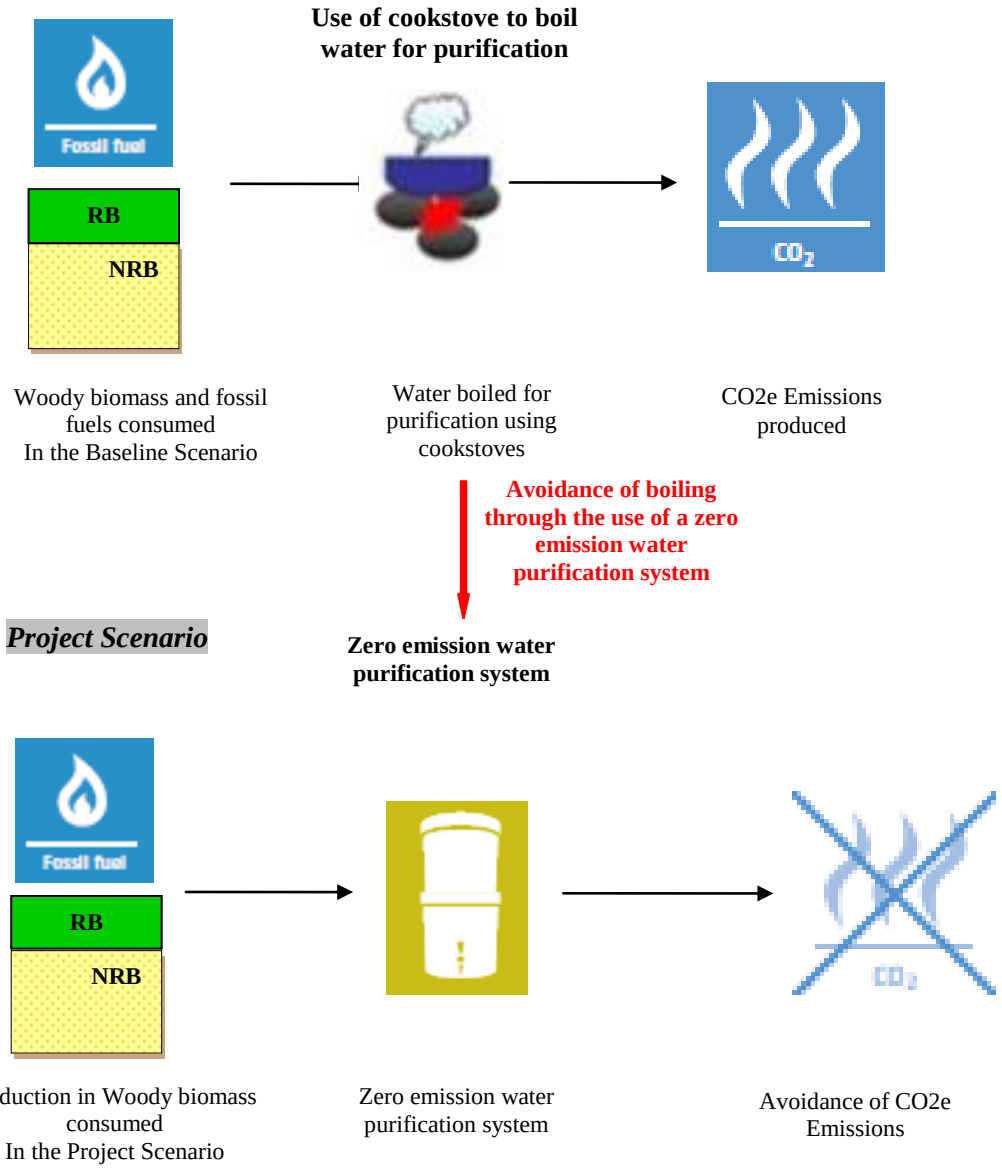
See Section B.2 in Generic CPA 1.

B.3. Sources and GHGs

The project boundary includes the physical, geographical sites of the low greenhouse gas emitting technologies for water purification installed by the project activity.

Source		Gas	Included?	Justification/Explanation
Baseline Scenario	Combustion of non-renewable biomass	CO_2	Yes	Major source of emissions
		CH_4	No	Minor source of emissions and limited data available. This is conservative.
		N_2O	No	Minor source of emissions and limited data available. This is conservative.
Project Scenario	Not applicable (no project emissions)	CO_2	No	N/A – no project emissions in CPA type 2
		CH_4	No	N/A – no project emissions in CPA type 2
		N_2O	No	N/A – no project emissions in CPA type 2

Flow Diagram



B.4. Description of baseline scenario

See Section B.4 in Generic CPA 1.

B.5. Demonstration of eligibility for a generic CPA

The eligibility criteria for inclusion of a CPA in the PoA are based on the *Standard for Demonstration of Additionality, Development of Eligibility Criteria and Application of Multiple Methodologies for Programme Activities* (version 03.0), Annex 05 of EB 74

The verifiable evidence presented in the 'CPA Indicator' column below is exemplary. The CPA implementer may choose which evidence to provide to confirm compliance with the eligibility criteria, and not all evidence provided in the column must be submitted as long as the evidence is sufficient to prove eligibility.

Criteria Number	Eligibility Criteria Category	Description	CPA Indicator
1	Location	All water purification systems in each CPA are located within the geographical boundaries of Rwanda or Uganda.	❑ [tick when met] _____ Verifiable evidence: – Geographical reference points of borders in section A.7 of the CPA-DD.
2	Double Counting	Each water purification system has a unique serial number and programme logo engraved or permanently attached as a nameplate or sticker. The serial numbers are listed in the CPA Project database and recorded in the Sales Receipt. [*and*] The name of each end-user (or individual who purchased product for institution or community center) will be recorded as part of the Sales Receipt and CPA Project Database. The address will be recorded if possible, alternatively other means of locating the unit such as GPS can be used. [*and*] The CME has an agreement in place with owner of each individual water purification system in the CPA in which the owner transfers the rights to the emissions reductions exclusively to the CME as part of the Carbon Rights Waiver within the Sales Receipt. [*and*] The CME has an agreement in place with each technology supplier in which it is stated that the supplier transfers the rights to the emissions reductions of each water purification system exclusively to the CME.	❑ [tick when met] See Section C of the PoA-DD _____ Verifiable evidence: – Operations Manual, documented procedures. – Example of sales receipt/CRW – Agreement with technology supplier(s)
3	Technology	Each CPA will employ water purification systems that are point-of-use or point-of-entry treatment systems, and are in line with criterion 7). Technologies that use fossil fuels are not eligible. Each unit must achieve water quality defined in relevant national standards or international guidelines for drinking water quality. The technologies must meet minimum criteria for specific CPA type, as outlined below: *CPA type 2:Technologies for institutional water consumption, no project emissions* - Minimum flow rate: 1 L/hr or one dose treating 5 l - Minimum capacity/lifespan: 8000 L or 1 year - Fixed or portable: Portable or Fixed	❑ [tick when met] _____ Verifiable evidence: – Technological specifications of technology

		- Removal of E.coli: 99 (2-log) - Minimum Watts/Voltage: N/A - Institutions included must lack access to reliable electricity supply.	
4	Start Date	Each CPA will prove that the start date of the CPA is on or after the start date of the PoA, which is stated in section D.1 of the PoA-DD. The start date of the CPA is the date on which the first water purification systems to be included in the CPA are ordered from the manufacturer. This is the earliest date at which real action of the program activity was taken, on which the CME committed expenditures related to implementation with the purchase of the first units for the project activity. This is documented in the purchase order or contract agreement with the technology supplier.	❑ [tick when met] _____ Verifiable evidence: – Purchase order to technology supplier – Contract with technology supplier
5	Methodology	Each CPA will apply the baseline and monitoring methodology AMS-III.AV (Version 4). The CPA will introduce water purification systems to provide safe drinking water to households, institutions and/or communities.	❑ [tick when met] _____ Verifiable evidence: – Technological specifications document(s) –
6	Methodology	Prior to the implementation of the project activity, a public distribution network of safe drinking water did not exist within the project boundary. If, during the crediting period, any users are provided with safe drinking water through a public distribution network, these users will be removed from the CPA. This will be monitored annually or at least biennially.	❑ [tick when met] _____ Verifiable evidence: – Feasibility study or – National reports or – Official publications (e.g. from WHO) or – Water quality Tests or – Interviews with public officials, NGOs, end-users
7	Methodology	The water purification technology/equipment must achieve compliance with either: (c) a relevant national standard or (d) The interim performance targets as per "Evaluating	❑ [tick when met] _____ Verifiable evidence: – Laboratory test

		household water treatment options: Health based targets and microbiological performance specifications" (WHO, 2011)	report and/or official notifications (e.g. from national authority on health). – Technical specifications document(s)
8	Methodology	In the case that the life span of water treatment technologies is less than the length of the crediting period, all users (or individual who purchased product for institution or community center) will be provided with the contact details (phone number, email address and name) of the CME/CPA Implementer from whom replacement systems can be obtained via the Sales Receipt. The contact information provided for the CME or CPA implementer is a mobile number which is registered to the company and should not change. However, if a change is made to the contact information, (a) all users (or individual who purchased product for institution or community center) for whom contact information was collected will receive notification via SMS with updated information and/or (b) upon calling the original mobile number, caller shall be redirected to the updated contact. At the time of sale, sales representative will explain that the user can contact the CME or CPA implementer at any time when they need to purchase a replacement system. With this information, users are ensured a means of accessing replacement purification systems of comparable quality.	❑ [tick when met] Verifiable evidence: – Sales Receipt template
9	Additionality	Additionality of CPA shall be confirmed in line with the requirements of '*Guidelines on the Demonstration of Additionality of Small-Scale Project Activities'* (Attachment A to Appendix B) (version 09.0). In each CPA-DD it shall be demonstrated that: - the water purification system installed is operating as an isolated unit. - the users of the water purification systems are either households, institutions, or communities - the size of each unit is no larger than 5% of the	❑ [tick when met] – Sales Receipt template for specifying user group - Sales receipt template specifying user group - Emissions

		small-scale CDM threshold or 3,000 tCO2e reduced per year	Reductions calculations spreadsheet demonstrating ERs per unit
10	Local Stakeholder Consultation	A local stakeholder consultation has been carried out for the CPA.	❑ [tick when met] Verifiable evidence: – Local stakeholder consultation report
11	Environmental impact analysis (EIA)	An environmental impact analysis (EIA) has been carried out for the CPA, or evidence is provided that the programme activities are exempt from an EIA.	❑ [tick when met] Verifiable evidence: – EIA report or – EIA exemptions notice from the government
12	Public Funding	A written confirmation from the CPA Implementer has confirmed that no funding from Annex 1 parties has been used for this CPA [or] If used, a written confirmation from the donor confirms that this did not result in a diversion of official development assistance (ODA).	❑ [tick when met] Verifiable evidence: – Written confirmation from CPA implementer – If funding from Annex I parties was used, written confirmation from donor that it did not result in a diversion of ODA
13	Target Group	The target group will be Households, institutions or communities, as defined by the CPA type: CPA type 2: Institutions Target group is recorded in the Sales Receipt, to be distributed according to mechanisms described in section A.2, including direct sales and sales through distribution partners.	❑ [tick when met] Verifiable evidence: – Operations Manual – Contract with CPA Implementer or distribution partner

			– Technology type
14	Sampling requirements	The sampling method applied in the CPA (e.g. in the monitoring plan) follows the *Standard for Sampling and Surveys for CDM Project Activities and Programme of Activities* (EB 74, Annex 6). A minimum 90% confidence interval and a 10% margin of error requirement is achieved for the sampled parameters. When a single sampling plan covers a group of CPAs or when monitoring is conducted biennially (every two years), confidence/precision of 95/10 for the sample size calculation is applicable.	❑ [tick when met] _____ Verifiable evidence: – Sampling plan
15	Size Limit	The CPA's annual emissions reduction in aggregate remains below the small-scale limit of 60,000 tCO_2e reduced per annum throughout the crediting period.	❑ [tick when met] _____ Verifiable evidence: – Emissions reduction calculation spreadsheet
16	De-Bundling	The proposed CPA of the PoA is not a debundled component of a large scale activity because: Each of the independent subsystems/measures included in the CPA of a PoA is no larger than 1% of the small-scale thresholds defined by the applied methodology (i.e. not exceeding 600tCO_2e for SSC type III methodologies).	❑ [tick when met] _____ Verifiable evidence: – Emissions reduction calculation spreadsheet

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

B.6.1. Explanation of methodological choices

The following equations and methodological choices shall be applied for calculating baseline emissions, project emissions, leakage emissions, and emission reductions to each generic CPA as per the methodology AMS-III.AV, Version 04:

Baseline emissions shall be calculated as follows:

$$BE_y = QPW_y \times SEC \times f_{NRB,y} \times EF_{projected\ \_\ fossilfuel} \times 10^{-9} \qquad \text{Equation (1)}$$

Where:

BE_y	Baseline emissions during the year *y* in (tCO_2e)
QPW_y	Quantity of purified water in year *y* (Liters/yr). Calculation of QPW_y is demonstrated in Equations (1.a) and (1.b) below.
SEC	Specific energy consumption required to boil one litre of water (kJ/L)

	Calculation of SEC is demonstrated in Equation (2) below.
$f_{NRB,y}$	Fraction of woody biomass used in the absence of the project activity in year y that can be established as non-renewable. For biomass, the default values of f_{NRB} shall be used from EB67. A survey, national, or regional data is conducted to determine the mix of fuels (% of biomass, % of other fuels) used in the baseline. If a mixture of biomass and other fuels (e.g. fossil fuels) are used, a weighted average renewability factor shall be applied.
$EF_{projected\_fossilfuel}$	Emission factor when NRB is displaced or the emission factor of the fossil fuel substituted Default emission factors from AMS-I.E as referenced in AMS-III.AV version 4 and IPCC (2005) shall be used. A survey, national, or regional data is conducted to determine the mix of fuels (% of biomass, % of other fuels) used in the baseline. If a mixture of woody biomass and fossil fuels are used in the absence of the project activity a weighted average value shall be applied, as described in parameter box in section B.7.1

The quantity of purified water in year *y* (QPW_y) shall be calculated using Equation (1.a) for Case 1 and Equation (1.b) for Case 2 as demonstrated below. These equations follow paragraph 11 of the methodology that allows project participants to determine the amount of purified water and the amount of drinking water per person per day based on:

> (a) the population serviced by the project equipment, estimated using surveys and (b) an average volume of drinking water per person per day estimated using surveys or official data or peer reviewed literature or local expert opinion (a value of 5.5 litres per person per day shall not be exceeded). For Case 2, total project population needs to be adjusted for the fraction of the population serviced by the project equipment at households/buildings for which it can be demonstrated through documentation or survey that the practice of water purification would have been water boiling. (AMS-III.AV, version 4, para.11)

Case 1:

$$QPW_y = \sum_{0}^{i} (T_{y,i} \times N_{y,i} \times R_{y,i} \times 365 \times Water\ Quality_i \times Operational\ Units_i)$$

Equation (1.a)

QPW_y is the sum of the quantity of purified water for drinking for all technologies type *i*.

Where:

$T_{y,i}$	Total distributed water purification systems (number of units). The product of $T_{y,i}$ and $N_{y,i}$ represents "(a) the population serviced by the project equipment"
$N_{y,i}$	The average population serviced by water purification systems (person/equipment)

	The product of $T_{y,i}$ and $N_{y,i}$ represents "(a) the population serviced by the project equipment"
$R_{y,i}$	Average volume of drinking water per person per day (Liters/person/day) $R_{y,i}$ represents "(b) an average volume of drinking water per person per day."
Water Quality$_i$	Percent of units that meet water quality requirements *Water Quality*$_i$ parameter is used to modify $T_{y,i}$ such that only the proportion of units that meet required water quality standards out of the total sampled units shall be applied in calculation of QPW_y.
Operational Units$_i$	Percent of the monitoring period in which the units are in use *Operational Units*$_i$ parameter is used to modify $T_{y,i}$, such that only such that only the mean proportion of the monitoring period that the units are in use shall be applied in calculation of QPW_y. If multiple technology types are included, monitoring would measure parameter for each type of technology separately, as explained in monitored parameters section B.7.1.

Case 2:
For CPAs that fall under Case 2 (e.g. more than 60% of the target population have access to clean drinking water), ex-ante surveys are undertaken to establish the proportion of total population for which the common practice of water purification is or would have been water boiling, per paragraph 11 of the methodology.

$$QPW_y = \sum_0^i (X_{boil} \times T_{y,i} \times N_{y,i} \times R_{y,i} \times 365 \times Water\ Quality_i \times Operational\ Units_i)$$

Equation (1.b)

Where:

$X_{boil,i}$	The proportion of total population for which the common practice of water purification is or would have been water boiling (percentage) Parameter is required to adjust for the fraction of the population serviced by the project equipment at households/buildings for which it can be demonstrated through documentation or survey that the practice of water purification would have been water boiling, as stated in the methodology. Ex-ante surveys are undertaken to establish this value.
$T_{y,i}$	Total distributed water purification systems (number of units). The product of $T_{y,i}$ and $N_{y,i}$ represents "(a) the population serviced by the project equipment"
$N_{y,i}$	The average population serviced by water purification systems (person/equipment) The product of $T_{y,i}$ and $N_{y,i}$ represents "(a) the population serviced by the project equipment"

$R_{y,i}$	Average volume of drinking water per person per day (Liters/person/day) $R_{y,i}$ represents "(b) an average volume of drinking water per person per day"
Water Quality$_i$	Percent of units that meet water quality requirements *Water Quality*$_i$ parameter is used to modify $T_{y,i}$ such that only the proportion of units that meet required water quality standards out of the total sampled units shall be applied in calculation of QPW_y.
Operational Units$_i$	Percent of the monitoring period in which the units are in use *Operational Units*$_i$ parameter is used to modify $T_{y,i}$, such that only such that only the mean proportion of the monitoring period that the units are in use shall be applied in calculation of QPW_y.

The specific energy consumption [SEC] required to boil one litre of water shall be calculated as follows:

$$SEC = [WH \times (T_f - T_i) + 0.01 \times WHE]/n_{wb} \quad \text{Equation (2)}$$

Where:

WH	Specific heat of water (kJ/L ^oC)
T_f	Final temperature (^oC)
T_i	Initial temperature of water (^oC)
WHE	Latent heat of water evaporation (kJ/L)
η_{wb}	Efficiency of water boiling system being replaced (fraction) The CPA Implementer will provide information on the baseline technology (i.e. system being replaced) to determine the value for η_{wb}, the efficiency value of the water boiling system. The type of baseline water boiling system used by target population will be determined via survey or national data. The efficiency value for the system being replaced will be determined using the following default values from the methodology: **Baseline Water Boiling System** / **Default Efficiency Value** Unimproved biomass burning stove / 0.1 Other biomass burning stove / 0.2 Fossil fuel stove / 0.5 If more than one system is encountered, a weighted average of values will be applied.

Emissions Reductions shall be calculated using Equation (3) below. This equation is in line with methodology with incorporation of leakage as adjustment to baseline emissions and the application of PEy, as explained below.

$$ER_y = (BE_y \times L - PE_y)$$ Equation (3)

Where:

ER_y	Emissions reductions during the year *y* in tCO_2e
BE_y	Baseline emissions from the use of non-renewable biomass (NRB) to boil water as a means of water purification, calculated in Equation (1) above.
L	Leakage factor to account for non-renewable woody biomass (fraction). Leakage relating to the non-renewable woody biomass is assessed as per the relevant procedures of AMS-I.E, as allowed by AMS-III.AV. The default value of 0.95 is applied to account for leakage.
PE_y	Project emissions from onsite consumption of fossils or electricity due to the project activity. As CPA type does not use fossil fuels or electricity, PE_y is zero.

B.6.2. Data and parameters that are to be reported ex-ante

(Copy this table for each data and parameter.)

Data / Parameter	Case1 or Case 2
Unit	-
Description	Case 1 or Case 2: Project activities implemented in rural or urban areas of countries with proportion of rural or urban population using an improved drinking-water source equal to or less than 60 % (Case1) or above 60% (Case2);
Source of data	Survey or literature (For survey sampling refer to the sampling section of the monitoring plan under B.7.2)
Value(s) applied	[Case 1 or Case 2]
Choice of data or Measurement methods and procedures	Case 1 and Case 2 will be determined using one of the three options below: (i) Proportion of populations using an improved drinking-water source for the most recent year for which data is available from WHO/UNICEF Joint Monitoring Programme (JMP) for Water Supply and Sanitation shall be used (<http://www.wssinfo.org/data-estimates/table/>) for this purpose. Definition of improved and unimproved drinking water source shall be as per the information provided by JMP; (ii) Using official data such as publicly available statistical data from a government agency or an independently commissioned study by an international organization or an university; (iii) Using survey methods (use 90/10 confidence/precision for sampling).
Purpose of data	Determination of Case 1 or Case 2 for baseline and opting for appropriate emission reductions calculations methods
Additional comment	-

[The following parameter, X_{boil}, will only be included if the CPA falls under Case 2.]

Data / Parameter	X_{boil}
Unit	Fraction
Description	The proportion of total population for which the common practice of water purification is or would have been water boiling;
Source of data	Survey or literature (For survey sampling refer to the sampling section of the monitoring plan under B.7.2)
Value(s) applied	Refer to specific CPA
Choice of data or Measurement methods and procedures	Ex-ante surveys or literature will measure this parameter.
Purpose of data	Calculation of Case 2 baseline emissions
Additional comment	Applicable only to Case 2

Data / Parameter	WH
Unit	Kj/L ^{o}C
Description	Specific Heat of Water
Source of data	Default Value from AMS-III.AV Version 4
Value(s) applied	4.186
Choice of data or Measurement methods and procedures	-
Purpose of data	Calculation of baseline emissions
Additional comment	-

Data / Parameter	T_f
Unit	^{o}C
Description	Final Temperature
Source of data	Default Value from AMS-III.AV Version 4
Value(s) applied	100
Choice of data or Measurement methods and procedures	-
Purpose of data	Calculation of baseline emissions
Additional comment	-

Data / Parameter	T_i
Unit	^oC
Description	Initial Temperature
Source of data	Default Value from AMS-III.AV Version 4
Value(s) applied	20
Choice of data or Measurement methods and procedures	-
Purpose of data	Calculation of baseline emissions
Additional comment	-

Data / Parameter	WHE
Unit	Kj/L
Description	Latent Heat of Water Evaporation
Source of data	Default Value from AMS-III.AV Version 4
Value(s) applied	2,260
Choice of data or Measurement methods and procedures	-
Purpose of data	Calculation of baseline emissions
Additional comment	-

Data / Parameter	L
Unit	-
Description	Leakage
Source of data	Default Value from AMS-I.E Version 5
Value(s) applied	.95
Choice of data or Measurement methods and procedures	Methodological default
Purpose of data	Calculation of leakage emissions
Additional comment	-

Data / Parameter	$R_{y,i}$
Unit	Liters/person/day
Description	Average volume of drinking water per person per day
Source of data	WHO Minimum water quantity needed for domestic use in emergencies.
Value(s) applied	3.5 (for boarding schools, prisons) 2 (for day schools)
Choice of data or Measurement methods and procedures	WHO data on the minimum 'survival' allocation for drinking water per person and water per pupil.
Purpose of data	Calculation of QPW_y Used in equation (1.a) or (1.b), see section D.6.1
Additional comments	Per the methodology, if the calculation of QPW_y is based on the average volume of drinking water per person per day, a value of 5.5 litres per person per day shall not be exceeded. Whilst the cap in the methodology is 5.5 L/person/day, the PoA applies an effective cap of 3.5 L/person/day in the case of boarding schools or prisons and 2 L/person/day for day schools, which is more conservative, and a more realistic figure of the quantity of water that would be used for drinking purposes. $N_{y,i}$ multiplied by $R_{y,i}$ shall not exceed the maximum output of the technology [per unit].

B.6.3. Ex-ante calculations of emission reductions

[In this section, each CPA-DD will demonstrate calculation of ex-ante emission reductions pertaining to the specific CPA and CPA type using the methodological equations demonstrated in section B.6.1 above. A generic tabulated emission reduction format is provided below.]

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

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

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

(Copy this table for each data and parameter)

QPW_y, the total volume of drinking water produced by technologies under the CPA is calculated through Equation (1.a) or (1.b) in the PoA-DD document, therefore parameters $T_{y,i}$ and $N_{y,i}$ need to be monitored, and a value of 5.5 litres per person per day shall not be exceeded.

Data / Parameter	QPW_y
Unit	Liters/yr
Description	Quantity of purified water in year *y* (litres)
Source of data	Calculation
Value(s) applied	Refer to specific CPA
Measurement methods and procedures	Calculated through Equation (1.a) or (1.b) For Case 1: $QPW_y = \sum_0^i (T_{y,i} \times N_{y,i} \times R_{y,i} \times 365 \times Water\ Quality_i \times Operational\ Units_i)$ For Case 2: $QPW_y = \sum_0^i (X_{boil} \times T_{y,i} \times N_{y,i} \times R_{y,i} \times 365 \times Water\ Quality_i \times Operational\ Units_i)$
Monitoring frequency	Annual or at least biennial as per the monitoring requirements in the methodology
QA/QC procedures	-
Purpose of data	Calculation of baseline emissions
Additional comments	-

Data / Parameter	$T_{y,i}$
Unit	units
Description	Total distributed water purification systems
Source of data	Sales invoices database
Value(s) applied	Refer to specific CPA
Measurement methods and procedures	The total number of units by technology type and date deployed in each specific CPA is tracked in the in the Project Database, using Sales Receipts. All units distributed will be recorded. Any unit not recorded in the Project Database will not be credited for emission reductions.
Monitoring frequency	Continuous
QA/QC procedures	Sales Database is cross-checked with paper records to ensure transparent and robust data. Replacement units will be captured in monitoring the number of *Operational Units*$_i$.
Purpose of data	Calculation of baseline emissions
Additional comments	-

Data / Parameter	$N_{y,i}$
Unit	Persons/unit
Description	The average population serviced by water purification systems
Source of data	Sales receipt
Value(s) applied	Refer to Specific CPA
Measurement methods and procedures	At the time of sale the number of people using the unit will be recorded in the sales receipt
Monitoring frequency	Continuously.
QA/QC procedures	$N_{y,i}$ multiplied by $R_{y,i}$ shall not exceed the maximum output of the technology [per unit].
Purpose of data	Calculation of QPW_y and capping the treated water consumed at 5.5 litres per person per day per paragraph 6 of the methodology Used in equation (1.a) or (1.b), see section D.6.1
Additional comments	-

Data / Parameter	Water Quality$_i$
Unit	[proportion]
Description	Water quality measurement
Source of data	Sampling surveys
Value(s) applied	Refer to specific CPA
Measurement methods and procedures	Water Quality testing will be done on sample of units per each technology type. After samples are chosen, a dedicated water container will be taken to the location where the system is installed to take a sample of the cleaned water for testing using the appropriate testing technology. Water quality is defined in a relevant national standard or guidelines for drinking water quality. An indicator may be monitored to assess whether samples meet these requirements. In case a national standard / guideline for drinking water quality is not available, the interim performance targets as per "Evaluating household water treatment options: Health based targets and microbiological performance specifications" (WHO, 2011). Each unit is deemed to meet relevant standards or not. The parameter is a proportion of units of the specific technology type that meet standards out of the total units sampled.
Monitoring frequency	Annual or at least biennial as per the monitoring requirements in the methodology.
QA/QC procedures	As per the World Health Organizations Guidelines[28] it is more cost-effective and feasible to monitor indicator organisms such as E.coli. Monitoring of proxies such as E.coli, faecal coliform counts, chlorine levels may be used to assess water quality. Enumerators will be trained on proper testing procedures and the appropriate testing technology will be used
Purpose of data	Eligibility criteria and Emission Reduction calculations in Equation (1.a) or (1.b). For Case 1: $QPW_y = \sum_0^i (T_{y,i} \times N_{y,i} \times R_{y,i} \times 365 \times Water\ Quality_i \times Operational\ Units_i)$ For Case 2: $QPW_y = \sum_0^i (X_{boil} \times T_{y,i} \times N_{y,i} \times R_{y,i} \times 365 \times Water\ Quality_i \times Operational\ Units_i)$
Additional comments	-

[28] WHO 'Guidelines for Drinking-water Quality, Fourth Edition
www.who.int/**water**_sanitation_health/publications/.../dwq_**guidelines**/ Page 41

Data / Parameter	Operational Units$_i$
Unit	-
Description	Monitoring to check the percentage of the monitoring period which units of each technology type are in use
Source of data	Sampling surveys
Value(s) applied	Refer to specific CPA
Measurement methods and procedures	Surveys will be conducted on sample of units per each technology type. The survey will then determine what percentage of days of the monitoring period the unit is in use by the end user. The mean of the percentage of operational days of the monitoring period of the samples will be applied for the parameter for each technology type. In this CPA type, Operational Units will further confirm that unit is being used according to technical specifications, i.e. if it is a UV system connected to a solar panel, it shall not be connected to any electricity supply other than the Solar PV panel/system supplied with the unit. If the unit is not used according to specifications, it shall be deemed to be not in operation from the beginning of the monitoring period and deemed to be operational for 0% of the relevant monitoring period. This shall be determined through the monitoring of a sample of solar powered devices; the fraction of units found using any energy source other than the Solar PV panel/system supplied with the unit and considered not in use shall be applied to the full population of UV systems connected to solar panels.
Monitoring frequency	At least once per verification or biennially as per the monitoring requirements in the methodology.
QA/QC procedures	Enumerators will ensure that the unit present in the household is the same one as in the sales database by checking the unique serial number. In the case that the unique serial number is no longer visible enumerators will inquire as to the date of purchase of the unit to ensure that the unit is not a replacement. If the specific unit selected for monitoring has been replaced it will be marked as out of use and deemed to be operational for 0% of the relevant monitoring period. Enumerators will be trained as to proper procedures to assess the percentage of the monitoring period which the unit is used.
Purpose of data	Emission reductions calculations Used in Equation (1.a) or (1.b), see section D.6.1
Additional comments	-

Data / Parameter	$f_{NRB,y}$
Unit	-
Description	Fraction of woody biomass used in the absence of the project activity in year *y* that can be established as non-renewable
Source of data	EB 67 Annex 22 Default Values for Fraction of Non-Renewable Biomass for Least Developed Countries and Small Island Developing States, combined with survey, national, or regional data to determine the percent of users using woody biomass and fossil fuel in the baseline scenario. If the displaced fuel is fossil fuel use the default value of 1.0. If a mixture of woody biomass and fossil fuels is used in the absence of the project activity a weighted average value should be used, using surveys or national data.
Value(s) applied	See Specific CPA
Measurement methods and procedures	The type of baseline fuel(s) used by target population will be determined via survey, national, or regional data. Parameter will be determined using the default values from EB67 Annex 22 for woody biomass and from the methodology for fossil fuels: If a mixture of woody biomass and fossil fuels is used in the absence of the project activity a weighted average value shall be applied, calculated through the following formula: $f_{NRB,y}$ = [Default f_{NRB} value] * [% of users using NRB] + [1.0] * [% of users using fossil fuels]
Monitoring frequency	Continuously or at least biennial as per the monitoring requirements in the methodology.
QA/QC procedures	If survey is conducted, enumerators will be trained as to proper procedures to assess the baseline stove that is being or would have been used to boil water
Purpose of data	Calculation of baseline emissions
Additional comment	Use of national data for the type of baseline fuel used is appropriate if the CPA covers the entire boundary of the host country. In case CPAs cover specific portions of the country, regional government data may be used to ensure more conservative and accurate representation of the target populations.

Data / Parameter	η_{wb}
Unit	Fraction
Description	Efficiency of water boiling system being replaced
Source of data	Default values as per AMS-III.AV combined with survey, national, or regional data to determine the percent of users using different types of water boiling systems in the baseline scenario.
Value(s) applied	See Specific CPA

<table>
<tr><td>Measurement methods and procedures</td><td>The type of baseline water boiling systems used by target population will be determined via survey, national, or regional data.

Parameter will be determined using the following default values from AMS-III.AV:
<table><tr><th>Baseline Water Boiling System</th><th>Default Efficiency Value</th></tr><tr><td>Unimproved biomass burning stove (UBBS)</td><td>0.1</td></tr><tr><td>Other biomass burning stove (OBBS)</td><td>0.2</td></tr><tr><td>Fossil fuel stove (FFS)</td><td>0.5</td></tr></table>
If more than one system is encountered, a weighted average value shall be applied, calculated through formula below:

η_{wb} = [Default efficiency of UBBS] * [% of UBBS users] +
[Default efficiency of OBBS] * [% of OBBS users] +
[Default efficiency of FFS] * [% of FFS users]</td></tr>
<tr><td>Monitoring frequency</td><td>Continuously or at least biennial as per the monitoring requirements in the methodology.</td></tr>
<tr><td>QA/QC procedures</td><td>If survey is conducted, enumerators will be trained as to proper procedures to assess the baseline stove that is being or would have been used to boil water.</td></tr>
<tr><td>Purpose of data</td><td>Calculation of baseline emissions</td></tr>
<tr><td>Additional comment</td><td>Use of national data to determine the proportion of people using each type of baseline water boiling system is appropriate if the CPA covers the entire boundary of the host country. In case CPAs cover specific portions of the country, regional government data may be used to ensure more conservative and accurate representation of the target populations.</td></tr>
</table>

Data / Parameter	$EF_{projected\_fossilfuel}$
Unit	tCO2/TJ
Description	Emission factor as per AMS-I.E procedures when NRB is displaced or the emission factor of the fossil fuel substituted
Source of data	AMS-I.E as referenced by AMS-III.AV Version 4 for f_{NRB} and IPCC default values for fossil fuels, combined with survey, national, or regional data to determine the percent of users using woody biomass and fossil fuel(s) in the baseline scenario.
Value(s) applied	See Specific CPA
Measurement methods and procedures	The type of baseline fuel used by target population will be determined via survey, national, or regional data. Parameter will be determined using the following default values from AMS-I.E as referenced by AMS-III.AV Version 4 and IPCC (2006): **Emission Factor for Baseline Fuels** / **Emissions Factor** / **Source** EF_{NRB} / 81.6 tCO2/TJ / AMS-I.E $EF_{NaturalGas}$ / 56.1 tCO2/TJ / IPCC $EF_{Kerosene}$ / 71.9 tCO2/TJ / IPCC EF_{LPG} / 63.1 tCO2/TJ / IPCC In the PoA boundary of Rwanda and Uganda, the population uses either woody biomass or fossil fuel.[29,30] If a mixture of woody biomass and fossil fuels is used in the absence of the project activity a weighted average value shall be applied, calculated through the following formula: $EF_{projected\_fossilfuel}$ = [EF_{NRB}]*[% of users using NRB] + [$EF_{Natural\ Gas}$]*[% of users using Natural Gas] + [$EF_{Kerosene}$]*[% of users using Kerosene] + [EF_{LPG}]*[% of users using LPG]
Monitoring frequency	Continuously or at least biennial as per the monitoring requirements in the methodology.
QA/QC procedures	Enumerators will be trained as to proper procedures to assess baseline fuel usage.
Purpose of data	Calculation of baseline emissions
Additional comment	Use of national data for the type of baseline fuel used is appropriate if the CPA covers the entire boundary of the host country. In case CPAs cover specific portions of the country, regional government data may be used to ensure more conservative and accurate representation of the target populations.

[29] Rwanda: Biomass Energy Strategy (BEST) Rwanda, RBESS, MININFRA, 2009
[30] Uganda: National Uganda National Household Survey 2009/2010

Data / Parameter	Existence of public distribution network of safe drinking water
Unit	-
Description	Existence of public distribution network of safe drinking water in year y
Source of data	Surveys and or updated credible national/local reports/letters/announcements in relation to the existence of water networks in the region
Value(s) applied	-
Measurement methods and procedures	Review of surveys or credible national/local reports/letters/announcements
Monitoring frequency	Annual or at least biennial as per the monitoring requirements in the methodology
QA/QC procedures	-
Purpose of data	Eligibility criteria
Additional comments	-

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

The monitoring procedures and sampling plan for the PoA is in-line with *AMS-III.AV low greenhouse gas emitting safe drinking water production systems* (Version 4) and the procedures outlined in paragraph 18 of the *Standard for Sampling and Surveys for CDM Project Activities and Programme of Activities* (EB 74, Annex 6), which refers to the *Guidelines for Sampling and Surveys for CDM Project Activities and Programme of Activities* (EB 75, Annex 8):

a) Sampling design
  (i) Objectives and Reliability Requirements
  (ii) Target population
  (iii) Sampling method
  (iv) Sample size
  (v) Sampling frame
b) Data to be collected
  (i) Field measurements
  (ii) Quality Assurance/Quality control
  (iii) Analysis
c) Implementation plan
d) Data Storage
e) Monitoring management

The above criteria are elaborated in the forthcoming paragraphs.

a) Sampling Design

Flexibility to apply cross-CPA sampling is critical for the feasibility of the proposed PoA due to the large number of CPAs envisaged. Cross-CPA sampling may only be conducted for CPAs of the same type to ensure homogeneity. The CME will define a sampling frame for each CPA type such that the homogeneity of the group can be expected to be sufficient to allow for cross-CPA sampling. The criteria for homogeneity across CPAs per EB 75 Annex 8 are listed in section *(v) Sampling Frame* below. A sampling approach may be set in a CPA, but as additional CPAs are included the sampling approach may change to enable cross-CPA sampling.

As a rule, the most appropriate confidence/precision levels required by the methodology AMS-III.AV (Version 4) and the Sampling Standard will be applied whenever sampling is undertaken. According to

the Sampling Standard, 95/10 reliability is to be applied whenever sampling across a group of CPAs, which will typically be the case for this PoA. In the case of conducting CPA-specific sampling, the methodology AMS-III.AV (Version 4) requires 90/10 confidence/precision if annual sampling is applied, or 95/10 confidence/prevision if biennial (every two years) sampling is applied.

(i) Objectives and Reliability Requirements

The objective of the sampling effort will be to meet the monitoring requirements set forth in the methodologies AMS-III.AV (Version 4), as detailed in B.7.1 above. Monitoring will be carried out on an annual basis (or biennial for specific parameters when allowed by the methodology, see B.7.1.). As the PoA progresses and the number of CPAs increases, the sampling plan can apply to a group of CPAs as referred to in EB 75, Annex 8. This will be applicable to CPA types as long as homogeneity can be demonstrated. When homogeneity cannot be demonstrated the CME may monitor CPAs individually.
All monitoring shall be coordinated by the CME, Impact Carbon.

The parameters to be obtained by means of sampling are listed below:

Parameter	Estimated Parameter Value*
$Water\ Quality_i$	[0-100]%
$Operational\ Units_i$	[0-100]%
$f_{NRB,y}$	[% of population using NRB, combined with default values]
η_{wb}	[% of each type of baseline stove usage, combined with default values]
$EF_{projected\_fossilfuel}$	[% of each type of baseline fuel, combined with default values]

*See specific-CPA.

Note that parameters $f_{NRB,y}$, η_{wb}, and $EF_{projected\_fossilfuel}$ shall be determined through default values combined with survey, national, or regional data. In case survey is chosen, the sampling plan described below shall apply.

(ii) Target Population

The target population for the application of monitoring procedure will be the institutions in which water purification systems have been installed, as identified through the centralised record-keeping Project Database managed by the CME. The database will include a unique identification number of the unit and end-user information including the location of the household. CPAs will be grouped by CPA type, and only CPAs of the same type and located in the same country may be sampled together.

(iii)Sampling method

See Section B.7.2 from Generic CPA 1, section *(iii) Sampling Method*.

(iv) Sample size

The sampling method, either simple random, stratified random sampling, or multi-stage sampling will be determined separately for each CPA, as described and justified below. The sample will be representative so that if multiple CPAs are grouped in the monitoring process the proportion of units sampled from each CPA will equal the proportion of total units in operation in the various CPAs, and 95/10 will be achieved for cross-CPA monitoring. If monitoring occurs on an annual basis for an individual CPA then any representative sampling will satisfy the 90/10 confidence/precision requirement. If monitoring occurs every two years for an individual CPA then any representative sampling will satisfy the 95/10 confidence/precision requirement. If the required level of accuracy (confidence/precision) is not achieved, the sample size can be expanded.

1. Simple random sampling may be used for monitoring all of the sampled parameters when the following conditions exist (as outlined in the table below). Justification for the use of this approach for each parameter is provided in table below:

Parameter	Justification/Assumptions for Simple Random Sampling
Water Quality$_i$	One technology and target group type; Devices not widely dispersed geographically
Operational Units$_i$	One technology and target group; Devices not widely dispersed geographically
η_{wb}	Devices not widely dispersed geographically (technology type/target group not applicable as parameter refers to baseline scenario)
$f_{NRB,y}$	Same as η_{wb}
$EF_{projected\_fossilfuel}$	Same as η_{wb}

Sample size is determined for Proportional Values under simple random sampling using:

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

Where:

n = Sample Size
N = Total Number of Households
p = Expected proportion
1.645 = Represents the 90% confidence interval (1.96 represents the 95% confidence interval)
0.1 = Represents the 10% relative precision

Sample size is determined for a Mean Value under simple random sampling using:

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

Where:

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

Where:

n = Sample Size
N = Total Number of Households
mean = Mean
SD = Standard deviation
1.645 = Represents the 90% confidence interval (1.96 represents the 95% confidence interval)
0.1 = Represents the 10% relative precision

2. Stratified random sampling may be used when the following conditions exist (as outlined in the table below). Stratified sampling is used to account for differences in technologies and/or target groups within one CPA. In the case that one CPA has a single technology type, but multiple

distinct target group, i.e. restaurants and villages, the strata would be the target group. Therefore the strata shall be the technology type and/or the target group.

Parameter	Justification/Assumptions for Stratified Random Sampling
Water Quality$_i$	Multiple technology types and/or target groups
Operational Units$_i$	Multiple technology types and/or target groups
η_{wb}	Multiple target groups only, stratification by technology type only is not applicable as parameter refers to baseline scenario
$f_{NRB,y}$	Same as η_{wb}
$EF_{projected\_fossilfuel}$	Same as η_{wb}

Sample size is determined for Proportional Values under stratified random sampling using:

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

Where: $V = \frac{SD^2}{\overline{p}^2} = \frac{\text{overall variance}}{\overline{p}^2}$ and $\overline{p}$ is the overall proportion.

Where:

n = Total sample size
1.645 = Represents the 90% confidence interval (1.96 represents the 95% confidence interval)
0.1 = Represents the 10% relative precision

Where:

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

Where:

n_i = Sample size of the i^{th} group, where i=1,..,k
g_i = Size of the i^{th} group, where i=1,..,k
N = Population total

Where:

$$SD^2 = \frac{\begin{matrix}(g_a \times p_a(1-p_a)) + p_b(g_b \times (1-p_b)) \\ +(g_c \times p_c(1-p_c)) + \cdots + (g_k \times p_k(1-p_k))\end{matrix}}{N}$$

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

Where:

p_i = Proportion for the i^{th} group, where i=1,…,k

Using above equations, the total sample size (n) is calculated. The total sample size must be divided into the sample size for each group, i.e. each technology type. This division of the total sample size is calculated through the following equation:

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

Sample size is determined for a Mean Value under stratified random sampling using:

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

Where:

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

Where:

n	Sample Size
N	= Total Number of Households
mean	= Mean
SD	= Overall Standard deviation
1.645	= Represents the 90% confidence interval (1.96 represents the 95% confidence interval)
0.1	= Represents the 10% relative precision

Where:

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

Where:

SD	= Weighted overall standard deviation (SD_i Standard Deviation of the i^{th} group where i=1…,k
g_a	= Size of the i^{th} group where i=1,…,k
N	= Population total

Where:

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

Where:

mean	= Weighted overall mean
m_i	= Mean of the i^{th} group where i=1,…,k

Using above equations, the total sample size (n) is calculated. The total sample size must be divided into the sample size for each group, i.e. each technology type. This division of the total sample size is calculated through the following equation:

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

In order to establish the sample size (the number of groups to be sampled) using the above formulas, the following parameters must be known:

- the total number of strata in the population
- the average units per strata
- an estimate of the proportion/mean
- an estimate of the variance within each strata

3. Multi-stage sampling may also be used when the following conditions exist (as outlined in the table below). Multi-stage sampling consists of selecting primary clusters units and sampling from the secondary sampling units. The primary sampling units shall be administrative clusters, i.e. district, region, county, or village [to be determined at specific CPA]. The secondary sampling unit shall be the units.

Parameter	Justification/Assumptions for Multi-stage Sampling
Water Quality$_i$	Devices widely dispersed geographically
Operational Units$_i$	Devices widely dispersed geographically types
η_{wb}	Devices widely dispersed geographically – use same location for baseline
$f_{NRB,y}$	Same as η_{wb}
$EF_{projected\_fossilfuel}$	Same as η_{wb}

Sample size is determined for proportional values under multi-stage sampling using:

$$c \geq \frac{\frac{SD_B^2}{\overline{p}^2} \times \frac{M}{M-1} + \frac{1}{\overline{u}} \times \frac{SD_w^2}{\overline{p}^2} \times \frac{(\overline{N}-\overline{u})}{(\overline{N}-1)}}{\frac{0.1^2}{1.645^2} + \frac{1}{M-1} \times \frac{SD_B^2}{\overline{p}^2}}$$

Where:

c	Number of groups that should be sampled
M	Total number of groups in the population
$\overline{u}$	Number of units to be sampled within each group
$\overline{N}$	Average units per group
SD_B^2	Unit variance
SD_W^2	Average of the group variances
p	Overall proportion
1.645	Represents the 90% confidence interval (1.96 represents the 95% confidence interval)
0.1	Represents the 10% relative precision

Sample size is determined for mean values under multi-stage sampling using:

$$c \geq \frac{\left(\frac{SD_B}{Clustermean}\right)^2 \times \left(\frac{M}{M-1}\right) + \left(\frac{1}{u}\right) \times \left(\frac{SD_W}{Overallmean}\right)^2 \left(\frac{\overline{N}-u}{\overline{N}-1}\right)}{\left(\frac{0.1}{1.645}\right)^2 + \frac{1}{M-1}\left(\frac{SD_B}{Clustermean}\right)^2}$$

Where:

c	= Number of groups that should be sampled
M	= Total number of groups in the population
$\underline{u}$	= Number of units to be sampled within each group
$\bar{N}$	= Average units per group
SD_B	= Standard deviation between groups
SD_W	= Average within group standard deviation
Clustermean	= The cluster or group mean
Overall mean	= The average across all households
1.645	= Represents the 90% confidence required (1.96 for 95% confidence)
0.1	= Represents the 10% relative precision

The precision and expected variance is established in accordance with the recommended values by UNFCCC[31], namely 95% precision and 10% expected variance, for cross-CPA sampling.

In order to establish the sample size (the number of groups to be sampled) using the above formulas, the following parameters must be known:
- the total number of groups in the population
- the average units per group
- an estimate of the proportion/mean
- an estimate of the variance between and within groups

The sample size calculation will be automated in an Excel spreadsheet so that different scenarios may be estimated.

If the sample size calculation returns a value of less than 30 samples, a minimum of 30 samples will be conducted.

(v) Sampling frame

See Section B.7.2 from Generic CPA 1, section *(v) Sampling frame*.

b) Data to be collected

(i) Field measurements

Field measurement objectives and data to be collected are listed in section B.7.1. The parameters to be sampled within each CPA will depend on if the project activity is deemed to be Case 1 or Case 2, as outlined below.

For each CPA, the following parameters are determined through sampling:

a) *Water Quality*$_i$
b) *Operational Units*$_i$
c) η_{wb}
d) $f_{NRB,y}$
e) $EF_{projected\_fossilfuel}$

[31] Standard for Sampling and Surveys for CDM Project Activities and Programme of Activities (EB 74, Annex 6).

Parameters will be obtained using sampling and will meet 90/10 confidence precision when sampled as a single CPA and 95/10 confidence and precision when sampled across CPAs or if monitoring is conducted on a biennial (every two years) basis.

For CPAs that fall under Case 2 (e.g. more than 60% of the target population have access to clean drinking water), ex-ante surveys are undertaken to establish:

f) X_{boil} - the proportion of total population for which the common practice of water purification is or would have been water boiling;

The CPA monitoring draws on information from the electronic data management system. The CME will operate and manage an electronic data management system that will store information on and track all technologies under the PoA. The system will contain the following information:

- Volume of units disseminated under the PoA
- Technology type for each unit
- Unique identification number for each unit
- Name, address, and contact information of the end-user (where possible)
- Date of installation (where possible)
- CPA assignment

The date of installation for each unit is used to determine the portion of the monitoring period during which the unit was active. Products deployed under the project activity are assumed be in operation as of the start of the next month following the date of sale, i.e. if the date of sale is April 1st, the start of operation is May 1st.

Monitoring will ensure the water quality of the water treated by the products employed under each CPA, as required under AMS-III.AV (Version 4). It shall be demonstrated that the application of the project technology/equipment achieves compliance with "protective"[32] or interim WHO performance targets as per "Evaluating households water treatment options: Health based targets and microbiological performance specifications" (WHO, 2011) or a comparable national standard or guideline. As per the World Health Organizations Guidelines[33] it is more cost-effective and feasible to monitor indicator organisms such as E.coli. Monitoring of proxies such as E.coli, faecal coliform counts, chlorine levels may be used to assess water quality. Enumerators will be trained on proper testing procedures and the appropriate testing technology will be used.

Upon installation of the water purification units, and associated accessories, the user will sign a Sales Receipt. For units that are not self-installed, a Sales Receipt will be signed upon commissioning. The sales and installation persons shall be responsible for ensuring that all data are complete and accurate within respective documents. Hard copies of both documents will be kept at the office of the CME, and all data entered into a central record keeping database.

The record keeping database will be used to record the results of all monitoring, thereby avoiding double counting, with all data stored to be kept for at least two years after the crediting period or the last issuance of CERs for the project activity. The data will be stored electronically in the database, with original hard copies of all collected monitoring data also kept.

[32] Protective default performance target is defined by a 2 $\log_{10}$ reduction of bacteria, a 3 $\log_{10}$ reduction of viruses and a 2 $\log_{10}$ reduction of protozoa ("protective"). The reference pathogens shall be C. Jejuni, C*R*yptosporidium, and rotavirus.

[33] WHO 'Guidelines for Drinking-water Quali*T*y, Fourth Edition
www.who.int/**water**_sanitation_health/publications/.../dwq_**guidelines**/ Page 41

(i) Quality Assurance/Quality Control

See Section B.7.2 from Generic CPA 1, section *(ii) Quality Assurance/Quality Control*.

(ii) Analysis

See Section B.7.2 from Generic CPA 1, section *(iii) Analysis*.

(c) Implementation Plan

See Section B.7.2 from Generic CPA 1, section *(c) Implementation Plan.*

(d) Data storage

See Section B.7.2 from Generic CPA 1, section *(d) Data storage.*

(e) Monitoring Management

See Section B.7.2 from Generic CPA 1, section *(e) Monitoring Management*.

PART II. Generic component project activity

CPA type 3: Technologies for institutional water consumption, with project emissions

SECTION A. General description of a generic CPA

A.1. Purpose and general description of generic CPAs

The significant majority of institutions in [Host Country] lack access to potable water [add reference]. While many people do not treat their water at all, due to insufficient resources or lack of knowledge about the need, [X %], relying on boiling to purify water [add reference]. With this practice pervasive throughout the country, the health and environmental impacts are widespread and severe: it results in significant greenhouse gas (GHG) emissions through the use of non-renewable fuelwood, causes deforestation, threatens biodiversity, and can create an economic hardship for families to access clean drinking water. Families that purify water through boiling are left vulnerable to the negative effects of poor indoor air quality while those that do not boil, or only boil occasionally, suffer from waterborne diseases. Together, exposure to the harmful pollutants generated from traditional stoves and diseases induced from drinking non-treated water are responsible for over 5 million deaths globally per year, 1.5 million and 3.5 million respectively (WHO 2005;WHO 2008). In [Host Country] indoor air pollution contributed to [X] annual deaths and another [X] are caused by diarrheal diseases each year. [add reference]
The purpose of this CPA is to provide access to clean water technologies that achieve water quality levels equivalent to boiled water.

The CPA Implementer, CME, and various local partners work together to distribute the following specific technologies to institutions within the CPA boundary of [specify boundary].

- Ultraviolet disinfection devices
- Reverse Osmosis systems

The CME provides CPA implementers and local partners with access to clean water purification technologies. CPA implementers and partners leverage or create local distribution channels of [specify distribution channel, which may vary by CPA implementer, but may include direct sales,etc.] to reach institutions with water purification technologies. Carbon revenues are used to subsidize the cost of distribution and/or of the product.

The CPA Implementer adheres to the CME management system (section C of the PoA-DD) and provides the CME with information required to include the project activity under the PoA and perform monitoring and verification of the activity.

SECTION B. Application of a baseline and monitoring methodology
B.1. Reference of the approved baseline and monitoring methodology(ies) selected

The CPA operates under *AMS-III.AV low greenhouse gas emitting safe drinking water production systems* (Version 4). The calculation of leakage refers to guidance from AMS-I.E. *Switch from non-renewable biomass for thermal applications by the user*, (Version 5), as noted below.

The CPA uses the "Tool to calculate baseline, project, and/or leakage CO_2 emissions from electricity consumption" (Version 1).

B.2. Application of methodology(ies)

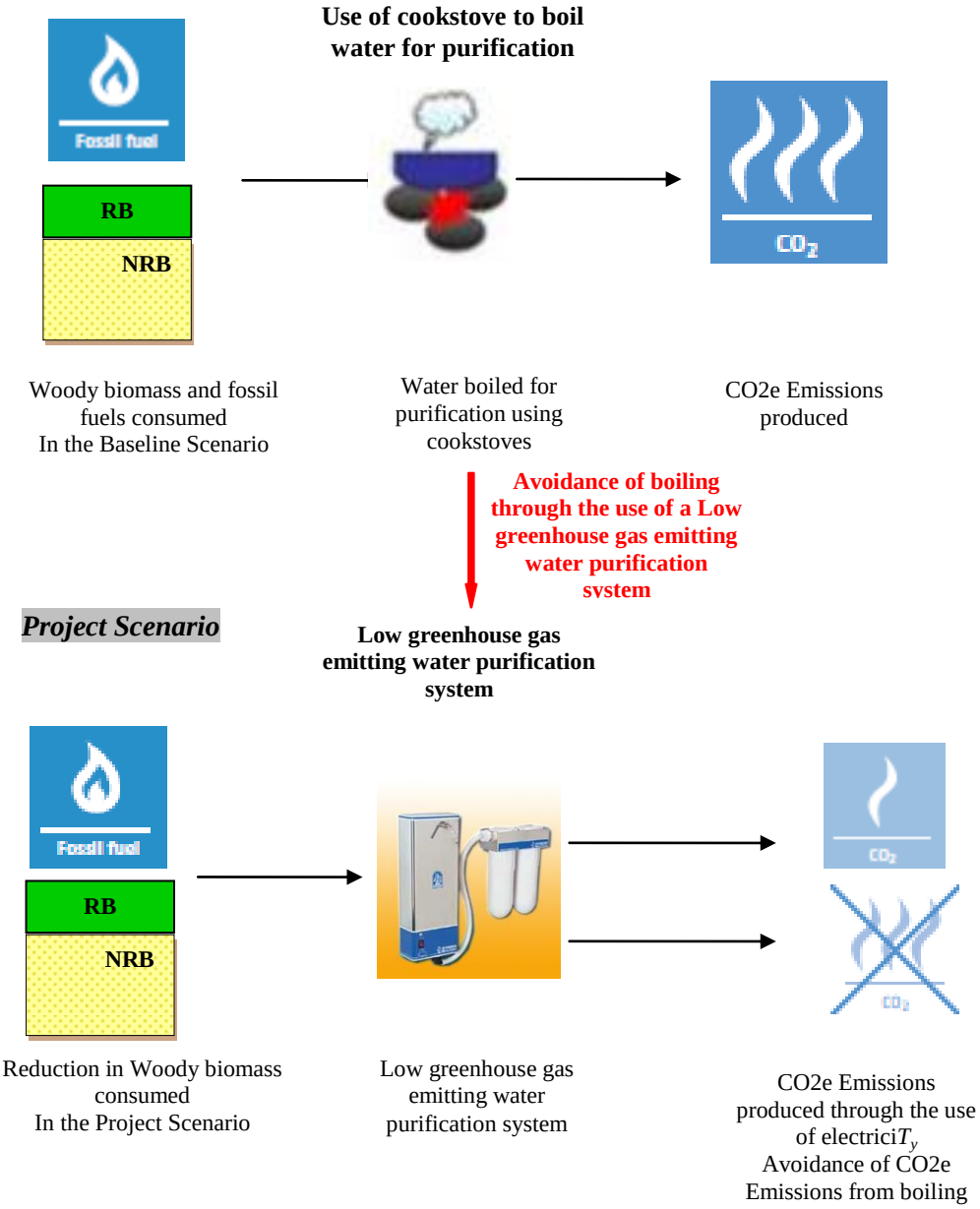
See Section B.2 in Generic CPA 1.

B.3. Sources and GHGs

The project boundary includes the physical, geographical sites of the low greenhouse gas emitting technologies for water purification installed by the project activity.

Source		Gas	Included?	Justification/Explanation
Baseline Scenario	Combustion of non-renewable biomass	CO_2	Yes	Major source of emissions
		CH_4	No	Minor source of emissions and limited data available. This is conservative.
		N_2O	No	Minor source of emissions and limited data available. This is conservative.
	Emissions from electricity usage for water purification technologies	CO_2	Yes	Major source of emissions
		CH_4	No	Minor source of emissions and limited data available
		N_2O	No	Minor source of emissions and limited data available

Flow Diagram



B.4. Description of baseline scenario

See Section B.4 in Generic CPA 1.

B.5. Demonstration of eligibility for a generic CPA

The eligibility criteria for inclusion of a CPA in the PoA are based on the *Standard for Demonstration of Additionality, Development of Eligibility Criteria and Application of Multiple Methodologies for Programme Activities* (version 03.0), Annex 05 of EB 74

The verifiable evidence presented in the 'CPA Indicator' column below is exemplary. The CPA implementer may choose which evidence to provide to confirm compliance with the eligibility criteria,

and not all evidence provided in the column must be submitted as long as the evidence is sufficient to prove eligibility.

Criteria Number	Eligibility Criteria Category	Description	CPA Indicator
1	Location	All water purification systems in each CPA are located within the geographical boundaries of Rwanda or Uganda.	❑ [tick when met] _____ Verifiable evidence: – Geographical reference points of borders in section A.7 of the CPA-DD.
2	Double Counting	Each water purification system has a unique serial number and programme logo engraved or permanently attached as a nameplate or sticker. The serial numbers are listed in the CPA Project database and recorded in the Sales Receipt. [*and*] The name of each end-user (or individual who purchased product for institution or community center) will be recorded as part of the Sales Receipt and CPA Project Database. The address will be recorded if possible, alternatively other means of locating the unit such as GPS can be used. [*and*] The CME has an agreement in place with owner of each individual water purification system in the CPA in which the owner transfers the rights to the emissions reductions exclusively to the CME as part of the Carbon Rights Waiver within the Sales Receipt. [*and*] The CME has an agreement in place with each technology supplier in which it is stated that the supplier transfers the rights to the emissions reductions of each water purification system exclusively to the CME.	❑ [tick when met] See Section C of the PoA-DD _____ Verifiable evidence: – Operations Manual, documented procedures. – Example of sales receipt/CRW – Agreement with technology supplier(s)
3	Technology	Each CPA will employ water purification systems that are point-of-use or point-of-entry treatment systems, and are in line with criterion 7). Technologies that use fossil fuels are not eligible. Each unit must achieve water quality defined in relevant national standards or international guidelines for drinking water quality. The technologies must meet minimum criteria for specific CPA type, as outlined below: *CPA type 3: Technologies for institutional water consumption, with project emissions* - Minimum flow rate: 50 L/hr	❑ [tick when met] _____ Verifiable evidence: – Technological specifications of technology

		- Minimum capacity/lifespan: 219,000 L or 1 year - Fixed or portable: Fixed - Removal of E.coli: 99 (4-log) - Minimum Watts/Voltage: 5	
4	Start Date	Each CPA will prove that the start date of the CPA is on or after the start date of the PoA, which is stated in section D.1 of the PoA-DD. The start date of the CPA is the date on which the first water purification systems to be included in the CPA are ordered from the manufacturer. This is the earliest date at which real action of the program activity was taken, on which the CME committed expenditures related to implementation with the purchase of the first units for the project activity. This is documented in the purchase order or contract agreement with the technology supplier.	❑ [tick when met] _____ Verifiable evidence: – Purchase order to technology supplier – Contract with technology supplier
5	Methodology	Each CPA will apply the baseline and monitoring methodology AMS-III.AV (Version 4). The CPA will introduce water purification systems to provide safe drinking water to households, institutions and/or communities.	❑ [tick when met] _____ Verifiable evidence: – Technological specifications document(s) –
6	Methodology	Prior to the implementation of the project activity, a public distribution network of safe drinking water did not exist within the project boundary. If, during the crediting period, any users are provided with safe drinking water through a public distribution network, these users will be removed from the CPA. This will be monitored annually or at least biennially.	❑ [tick when met] _____ Verifiable evidence: – Feasibility study or – National reports or – Official publications (e.g. from WHO) or – Water quality Tests or – Interviews with public officials, NGOs, end-users –
7	Methodology	The water purification technology/equipment must achieve compliance with either: (e) a relevant national standard or (f) The interim performance targets as per "Evaluating household water treatment options: Health based targets and microbiological performance	❑ [tick when met] _____ Verifiable evidence: – Laboratory test report and/or official

		specifications" (WHO, 2011)	notifications (e.g. from national authority on health). – Technical specifications document(s)
8	Methodology	In the case that the life span of water treatment technologies is less than the length of the crediting period, all users (or individual who purchased product for institution or community center) will be provided with the contact details (phone number, email address and name) of the CME/CPA Implementer from whom replacement systems can be obtained via the Sales Receipt. The contact information provided for the CME or CPA implementer is a mobile number which is registered to the company and should not change. However, if a change is made to the contact information, (a) all users (or individual who purchased product for institution or community center) for whom contact information was collected will receive notification via SMS with updated information and/or (b) upon calling the original mobile number, caller shall be redirected to the updated contact. At the time of sale, sales representative will explain that the user can contact the CME or CPA implementer at any time when they need to purchase a replacement system. With this information, users are ensured a means of accessing replacement purification systems of comparable quality.	❑ [tick when met] _____ Verifiable evidence: – Sales Receipt template
9	Additionality	Additionality of CPA shall be confirmed in line with the requirements of '*Guidelines on the Demonstration of Additionality of Small-Scale Project Activities'* (Attachment A to Appendix B) (version 09.0). In each CPA-DD it shall be demonstrated that: - the water purification system installed is operating as an isolated unit. - the users of the water purification systems are either households, institutions, or communities - the size of each unit is no larger than 5% of the small-scale CDM threshold or 3,000 tCO2e reduced per year	❑ [tick when met] _____ – Sales Receipt template for specifying user group - Sales receipt template specifying user group - Emissions Reductions calculations

			spreadsheet demonstrating ERs per unit
10	Local Stakeholder Consultation	A local stakeholder consultation has been carried out for the CPA.	❑ [tick when met] Verifiable evidence: – Local stakeholder consultation report
11	Environmental impact analysis (EIA)	An environmental impact analysis (EIA) has been carried out for the CPA, or evidence is provided that the programme activities are exempt from an EIA.	❑ [tick when met] Verifiable evidence: – EIA report or – EIA exemptions notice from the government
12	Public Funding	A written confirmation from the CPA Implementer has confirmed that no funding from Annex 1 parties has been used for this CPA [or] If used, a written confirmation from the donor confirms that this did not result in a diversion of official development assistance (ODA).	❑ [tick when met] Verifiable evidence: – Written confirmation from CPA implementer – If funding from Annex I parties was used, written confirmation from donor that it did not result in a diversion of ODA
13	Target Group	The target group will be Households, institutions or communities, as defined by the CPA type: CPA type 3: Institutions Target group is recorded in the Sales Receipt, to be distributed according to mechanisms described in section A.2, including direct sales and sales through distribution partners.	❑ [tick when met] Verifiable evidence: – Operations Manual – Contract with CPA Implementer or distribution partner – Technology type

14	Sampling requirements	The sampling method applied in the CPA (e.g. in the monitoring plan) follows the *Standard for Sampling and Surveys for CDM Project Activities and Programme of Activities* (EB 74, Annex 6). A minimum 90% confidence interval and a 10% margin of error requirement is achieved for the sampled parameters. When a single sampling plan covers a group of CPAs or when monitoring is conducted biennially (every two years), confidence/precision of 95/10 for the sample size calculation is applicable.	❑ [tick when met] _____ Verifiable evidence: – Sampling plan
15	Size Limit	The CPA's annual emissions reduction in aggregate remains below the small-scale limit of 60,000 tCO_2e reduced per annum throughout the crediting period.	❑ [tick when met] _____ Verifiable evidence: – Emissions reduction calculation spreadsheet
16	De-Bundling	The proposed CPA of the PoA is not a debundled component of a large scale activity because: Each of the independent subsystems/measures included in the CPA of a PoA is no larger than 1% of the small-scale thresholds defined by the applied methodology (i.e. not exceeding 600tCO_2e for SSC type III methodologies).	❑ [tick when met] _____ Verifiable evidence: – Emissions reduction calculation spreadsheet

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

B.6.1. Explanation of methodological choices

The following equations and methodological choices shall be applied for calculating baseline emissions, project emissions, leakage emissions, and emission reductions to each generic CPA as per the methodology AMS-III.AV, Version 04:

Baseline emissions shall be calculated as follows:

$$BE_y = QPW_y \times SEC \times f_{NRB,y} \times EF_{projected\ \_\ fossilfuel} \times 10^{-9} \qquad \text{Equation (1)}$$

Where:

BE_y	Baseline emissions during the year *y* in (tCO_2e)
QPW_y	Quantity of purified water in year *y* (Liters/yr). Calculation of QPW_y is demonstrated in Equations (1.a) and (1.b) below.
SEC	Specific energy consumption required to boil one litre of water (kJ/L) Calculation of SEC is demonstrated in Equation (2) below.

$f_{NRB,y}$	Fraction of woody biomass used in the absence of the project activity in year y that can be established as non-renewable. For biomass, the default values of f_{NRB} shall be used from EB67. A survey, national, or regional data is conducted to determine the mix of fuels (% of biomass, % of other fuels) used in the baseline. If a mixture of biomass and other fuels (e.g. fossil fuels) are used, a weighted average renewability factor shall be applied.
$EF_{projected\_fossilfuel}$	Emission factor when NRB is displaced or the emission factor of the fossil fuel substituted Default emission factors from AMS-I.E as referenced in AMS-III.AV version 4 and IPCC (2005) shall be used. A survey, national, or regional data is conducted to determine the mix of fuels (% of biomass, % of other fuels) used in the baseline. If a mixture of woody biomass and fossil fuels are used in the absence of the project activity a weighted average value shall be applied, as described in parameter box in section B.7.1

The quantity of purified water in year *y* (QPW_y) shall be calculated using Equation (1.a) for Case 1 and Equation (1.b) for Case 2 as demonstrated below. These equations follow paragraph 11 of the methodology that allows project participants to determine the amount of purified water and the amount of drinking water per person per day based on:

> (a) the population serviced by the project equipment, estimated using surveys and (b) an average volume of drinking water per person per day estimated using surveys or official data or peer reviewed literature or local expert opinion (a value of 5.5 litres per person per day shall not be exceeded). For Case 2, total project population needs to be adjusted for the fraction of the population serviced by the project equipment at households/buildings for which it can be demonstrated through documentation or survey that the practice of water purification would have been water boiling. (AMS-III.AV, version 4, para.11)

Case 1:

$$QPW_y = \sum_{0}^{i} (T_{y,i} \times N_{y,i} \times R_{y,i} \times 365 \times Water\ Quality_i \times Operational\ Units_i)$$

Equation (1.a)

QPW_y is the sum of the quantity of purified water for drinking for all technologies type *i*.

Where:

$T_{y,i}$	Total distributed water purification systems (number of units). The product of $T_{y,i}$ and $N_{y,i}$ represents "(a) the population serviced by the project equipment"
$N_{y,i}$	The average population serviced by water purification systems (person/equipment) The product of $T_{y,i}$ and $N_{y,i}$ represents "(a) the population serviced by the project equipment"

$R_{y,i}$	Average volume of drinking water per person per day (Liters/person/day) $R_{y,i}$ represents "(b) an average volume of drinking water per person per day."
Water Quality$_i$	Percent of units that meet water quality requirements *Water Quality*$_i$ parameter is used to modify $T_{y,i}$ such that only the proportion of units that meet required water quality standards out of the total sampled units shall be applied in calculation of QPW_y.
Operational Units$_i$	Percent of the monitoring period in which the units are in use *Operational Units*$_i$ parameter is used to modify $T_{y,i}$, such that only such that only the mean proportion of the monitoring period that the units are in use shall be applied in calculation of QPW_y. If multiple technology types are included, monitoring would measure parameter for each type of technology separately, as explained in monitored parameters section B.7.1.

Case 2:
For CPAs that fall under Case 2 (e.g. more than 60% of the target population have access to clean drinking water), ex-ante surveys are undertaken to establish the proportion of total population for which the common practice of water purification is or would have been water boiling, per paragraph 11 of the methodology.

$$QPW_y = \sum_0^i (X_{boil} \times T_{y,i} \times N_{y,i} \times R_{y,i} \times 365 \times Water\ Quality_i \times Operational\ Units_i)$$

Equation (1.b)

Where:

$X_{boil,i}$	The proportion of total population for which the common practice of water purification is or would have been water boiling (percentage) Parameter is required to adjust for the fraction of the population serviced by the project equipment at households/buildings for which it can be demonstrated through documentation or survey that the practice of water purification would have been water boiling, as stated in the methodology. Ex-ante surveys are undertaken to establish this value.
$T_{y,i}$	Total distributed water purification systems (number of units). The product of $T_{y,i}$ and $N_{y,i}$ represents "(a) the population serviced by the project equipment"
$N_{y,i}$	The average population serviced by water purification systems (person/equipment) The product of $T_{y,i}$ and $N_{y,i}$ represents "(a) the population serviced by the project equipment"
$R_{y,i}$	Average volume of drinking water per person per day (Liters/person/day)

	$R_{y,i}$ represents "(b) an average volume of drinking water per person per day"
Water Quality$_i$	Percent of units that meet water quality requirements *Water Quality*$_i$ parameter is used to modify $T_{y,i}$ such that only the proportion of units that meet required water quality standards out of the total sampled units shall be applied in calculation of QPW_y.
Operational Units$_i$	Percent of the monitoring period in which the units are in use *Operational Units*$_i$ parameter is used to modify $T_{y,i}$, such that only such that only the mean proportion of the monitoring period that the units are in use shall be applied in calculation of QPW_y.

The specific energy consumption [SEC] required to boil one litre of water shall be calculated as follows:

$$SEC = \left[WH \times \left(T_f - T_i\right) + 0.01 \times WHE\right]/n_{wb} \qquad \text{Equation (2)}$$

Where:

WH	Specific heat of water (kJ/L ^{o}C)
T_f	Final temperature (^{o}C)
T_i	Initial temperature of water (^{o}C)
WHE	Latent heat of water evaporation (kJ/L)
η_{wb}	Efficiency of water boiling system being replaced (fraction) The CPA Implementer will provide information on the baseline technology (i.e. system being replaced) to determine the value for η_{wb}, the efficiency value of the water boiling system. The type of baseline water boiling system used by target population will be determined via survey or national data. The efficiency value for the system being replaced will be determined using the following default values from the methodology: **Baseline Water Boiling System** / **Default Efficiency Value** Unimproved biomass burning stove / 0.1 Other biomass burning stove / 0.2 Fossil fuel stove / 0.5 If more than one system is encountered, a weighted average of values will be applied.

Emissions Reductions shall be calculated using Equation (3) below. This equation is in line with methodology with incorporation of leakage as adjustment to baseline emissions and the application of PEy, as explained below.

$$ER_y = (BE_y \times L - PE_y) \qquad \text{Equation (3)}$$

Where:

ER_y	Emissions reductions during the year *y* in tCO_2e
BE_y	Baseline emissions from the use of non-renewable biomass (NRB) to boil water as a means of water purification, calculated in Equation (1) above.
L	Leakage factor to account for non-renewable woody biomass (fraction). Leakage relating to the non-renewable woody biomass is assessed as per the relevant procedures of AMS-I.E, as allowed by AMS-III.AV. The default value of 0.95 is applied to account for leakage.
PE_y	Project emissions from onsite consumption of fossils or electricity due to the project activity. As CPA type involves consumption of electricity due to the project activity, calculation of PE_y is demonstrated in Equation (3.a) below.

Project emissions shall be calculated according to Equation (3.a). This equation follows the methodology, paragraph 14, advising calculation of CO2 emissions from electricity consumption by the project activity using the "Tool to calculate baseline, project, and/or leakage CO_2 emissions from electricity consumption" (Version 1).

$$PE_y = T_y \times EC_{PJ,j,y} \, x \, EF_{EL,j,y} \, x \left(1 + TDL_{j,y}\right) \qquad \text{Equation (3.a)}$$

Where:

$T_{y,i}$	Total distributed water purification systems (number of units)
$EC_{PJ,j,y}$	Quantity of electricity consumed by the project electricity consumption source j in year y (MWh/yr)
$EF_{EL,j,y}$	Emission factor for electricity generation for source j in year *y* (tCO2/MWh)
$TDL_{j,y}$	Average technical transmission and distribution losses for providing electricity to source j in year y

B.6.2. Data and parameters that are to be reported ex-ante

(Copy this table for each data and parameter.)

Data / Parameter	Case1 or Case 2
Unit	-
Description	Case 1 or Case 2: Project activities implemented in rural or urban areas of countries with proportion of rural or urban population using an improved drinking-water source equal to or less than 60 % (Case1) or above 60% (Case2).
Source of data	Survey or literature (For survey sampling refer to the sampling section of the monitoring plan under B.7.2)
Value(s) applied	[Case 1 or Case 2]
Choice of data or Measurement methods and procedures	Case 1 and Case 2 will be determined using one of the three options below: (i) Proportion of populations using an improved drinking-water source for the most recent year for which data is available from WHO/UNICEF Joint Monitoring Programme (JMP) for Water Supply and Sanitation shall be used (<http://www.wssinfo.org/data-estimates/table/>) for this purpose. Definition of improved and unimproved drinking water source shall be as per the information provided by JMP; (ii) Using official data such as publicly available statistical data from a government agency or an independently commissioned study by an international organization or an university; (iii) Using survey methods (use 90/10 confidence/precision for sampling).
Purpose of data	Determination of Case 1 or Case 2 for baseline and opting for appropriate emission reductions calculations methods
Additional comment	-

[The following parameter, X_{boil}, will only be included if the CPA falls under Case 2.]

Data / Parameter	X_{boil}
Unit	Fraction
Description	The proportion of total population for which the common practice of water purification is or would have been water boiling.
Source of data	Survey or literature (For survey sampling refer to the sampling section of the monitoring plan under B.7.2)
Value(s) applied	Refer to specific CPA
Choice of data or Measurement methods and procedures	Ex-ante surveys or literature will measure this parameter.
Purpose of data	Calculation of Case 2 baseline emissions
Additional comment	Applicable only to Case 2

Data / Parameter	WH
Unit	Kj/L ^{o}C
Description	Specific Heat of Water
Source of data	Default Value from AMS-III.AV Version 4
Value(s) applied	4.186
Choice of data or Measurement methods and procedures	-
Purpose of data	Calculation of baseline emissions
Additional comment	-

Data / Parameter	T_f
Unit	^{o}C
Description	Final Temperature
Source of data	Default Value from AMS-III.AV Version 4
Value(s) applied	100
Choice of data or Measurement methods and procedures	-
Purpose of data	Calculation of baseline emissions
Additional comment	-

Data / Parameter	T_i
Unit	^{o}C
Description	Initial Temperature
Source of data	Default Value from AMS-III.AV Version 4
Value(s) applied	20
Choice of data or Measurement methods and procedures	-
Purpose of data	Calculation of baseline emissions
Additional comment	-

Data / Parameter	WHE
Unit	Kj/L
Description	Latent Heat of Water Evaporation
Source of data	Default Value from AMS-III.AV Version 4
Value(s) applied	2,260
Choice of data or Measurement methods and procedures	-
Purpose of data	Calculation of baseline emissions
Additional comment	-

Data / Parameter	L
Unit	-
Description	Leakage
Source of data	Default Value from AMS-I.E Version 5
Value(s) applied	.95
Choice of data or Measurement methods and procedures	Methodological default
Purpose of data	Calculation of leakage emissions
Additional comment	-

Data / Parameter	$R_{y,i}$
Unit	Liters/person/day
Description	Average volume of drinking water per person per day
Source of data	WHO Minimum water quantity needed for domestic use in emergencies.
Value(s) applied	3.5 (for boarding schools, prisons) 2 (for day schools)
Choice of data or Measurement methods and procedures	WHO data on the minimum 'survival' allocation for drinking water per a person and water per pupil.
Purpose of data	Calculation of QPW_y Used in equation (1.a) or (1.b), see section D.6.1
Additional comments	Per the methodology, if the calculation of QPW_y is based on the average volume of drinking water per person per day, a value of 5.5 litres per person per day shall not be exceeded. Whilst the cap in the methodology is 5.5 L/person/day, the PoA applies an effective cap of 3.5 L/person/day in the case of boarding schools or prisons and 2 L/person/day for day schools, which is more conservative, and a more realistic figure of the quantity of water that would be used for drinking purposes. $N_{y,i}$ multiplied by $R_{y,i}$ shall not exceed the maximum output of the technology [per unit].

Data / Parameter	$EF_{EL,j,y}$
Unit	tCO2/MWh
Description	Emission factor for electricity generation for source j in year *y* (tCO2/MWh)
Source of data	As per the "Tool to calculate baseline, project, and/or leakage CO_2 emissions from electricity consumption" Version 1
Value(s) applied	1.3
Choice of data or Measurement methods and procedures	Default value from the "Tool to calculate baseline, project, and/or leakage CO_2 emissions from electricity consumption" Version 1: **Scenario A: Electricity system** In this case, project participants may choose among the following options: Option A1: Calculate the combined margin emission factor of the applicable electricity system, using the procedures in the latest approved version of the Tool to calculate the emission factor for an electricity system ($EF_{EL,j/k/l,y} = EF_{grid,CM,y}$). Option A2: Use the following conservative default values: A value of 1.3 tCO2/MWh if (a) Scenario A applies only to project and/or leakage electricity consumption sources but not to baseline electricity consumption sources; or (b) Scenario A applies to both baseline and project (and/or leakage) electricity consumption sources; and the electricity consumption of the project and leakage sources is greater than the electricity consumption of the baseline sources. Option A2 will be used.
Purpose of data	To calculate project emissions
Additional comment	To be considered only in the case the water purification device consumes electricity

Data / Parameter	$TDL_{j,y}$
Unit	Fraction
Description	Average technical transmission and distribution losses for providing electricity to source j in year y
Source of data	As per the "Tool to calculate baseline, project, and/or leakage CO_2 emissions from electricity consumption" Version 1
Value(s) applied	20%
Choice of data or Measurement methods and procedures	Default value from the "Tool to calculate baseline, project, and/or leakage CO_2 emissions from electricity consumption" Version 1
Purpose of data	To calculate project emissions
Additional comment	To be considered only in the case the water purification device consumes electricity

B.6.3. Ex-ante calculations of emission reductions

[In this section, each CPA-DD will demonstrate calculation of ex-ante emission reductions pertaining to the specific CPA and CPA type using the methodological equations demonstrated in section B.6.1 above. A generic tabulated emission reduction format is provided below.]

Year	Baseline emissions (t CO_2e)	Project emissions (t CO_2e)	Leakage (t CO_2e)	Emission reductions (t CO_2e)
Year 1	XXXX	XXXX	XXXX	XXXX
Year 2	XXXX	XXXX	XXXX	XXXX
Year 3	XXXX	XXXX	XXXX	XXXX
Year 4	XXXX	XXXX	XXXX	XXXX
Year 5	XXXX	XXXX	XXXX	XXXX
Year 6	XXXX	XXXX	XXXX	XXXX
Year 7	XXXX	XXXX	XXXX	XXXX
Total	XXXX	XXXX	XXXX	XXXX
Total number of crediting years	7			
Annual average over the crediting period	XXXX	XXXX	XXXX	XXXX

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

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

(Copy this table for each data and parameter)

QPW_y, the total volume of drinking water produced by technologies under the CPA is calculated through Equation (1.a) or Equation (1.b) in the PoA-DD document, therefore parameters $T_{y,i}$ and $N_{y,i}$ need to be monitored, a value of 5.5 litres per person per day shall not be exceeded.

Data / Parameter	QPW_y
Unit	Liters/yr
Description	Quantity of purified water in year *y* (litres)
Source of data	Calculation
Value(s) applied	Refer to specific CPA
Measurement methods and procedures	Calculated through Equation (1.a) or (1.b) For Case 1: $QPW_y = \sum_0^i (T_{y,i} \times N_{y,i} \times R_{y,i} \times 365 \times Water\ Quality_i \times Operational\ Units_i)$ For Case 2: $QPW_y = \sum_0^i (X_{boil} \times T_{y,i} \times N_{y,i} \times R_{y,i} \times 365 \times Water\ Quality_i \times Operational\ Units_i)$
Monitoring frequency	Annual or at least biennial as per the monitoring requirements in the methodology
QA/QC procedures	-
Purpose of data	Calculation of baseline emissions
Additional comments	-

Data / Parameter	$T_{y,i}$
Unit	units
Description	Total distributed water purification systems
Source of data	Sales invoices database
Value(s) applied	Refer to specific CPA
Measurement methods and procedures	The total number of units by technology type and date deployed in each specific CPA is tracked in the in the Project Database, using Sales Receipts. All units distributed will be recorded. Any unit not recorded in the Project Database will not be credited for emission reductions.
Monitoring frequency	Continuous
QA/QC procedures	Sales Database is cross-checked with paper records to ensure transparent and robust data. Replacement units will be captured in monitoring the number of *Operational Units*$_i$.
Purpose of data	Used in Equation (1.a) or (1.b) For Case 1: $QPW_y = \sum_0^i (T_{y,i} \times N_{y,i} \times R_{y,i} \times 365 \times Water\ Quality_i \times Operational\ Units_i)$ For Case 2: $QPW_y = \sum_0^i (X_{boil} \times T_{y,i} \times N_{y,i} \times R_{y,i} \times 365 \times Water\ Quality_i \times Operational\ Units_i)$
Additional comments	-

Data / Parameter	$N_{y,i}$
Unit	Persons/units
Description	The average population serviced by water purification systems
Source of data	Surveys
Value(s) applied	Refer to Specific CPA
Measurement methods and procedures	At the time of sale the number of people using the technology will be recorded in the sales receipt.
Monitoring frequency	Continuously .
QA/QC procedures	$N_{y,i}$ multiplied by $R_{y,i}$ shall not exceed the maximum output of the technology [per unit].
Purpose of data	Used in Equation (1.a) or (1.b) For Case 1: $QPW_y = \sum_0^i (T_{y,i} \times N_{y,i} \times R_{y,i} \times 365 \times Water\ Quality_i \times Operational\ Units_i)$ For Case 2: $QPW_y = \sum_0^i (X_{boil} \times T_{y,i} \times N_{y,i} \times R_{y,i} \times 365 \times Water\ Quality_i \times Operational\ Units_i)$
Additional comments	-

Data / Parameter	Water Quality
Unit	[proportion]
Description	Water quality measurement
Source of data	Sampling surveys
Value(s) applied	Refer to specific CPA
Measurement methods and procedures	Water Quality testing will be done on sample of units per each technology type. After samples are chosen, a dedicated water container will be taken to the location where the system is installed to take a sample of the cleaned water for testing using the appropriate testing technology. Water quality is defined in a relevant national standard or guidelines for drinking water quality. An indicator may be monitored to assess whether samples meet these requirements. In case a national standard / guideline for drinking water quality is not available, the interim performance targets as per "Evaluating household water treatment options: Health based targets and microbiological performance specifications" (WHO, 2011). Each unit is deemed to meet relevant standards or not. The parameter is a proportion of units of the specific technology type that meet standards out of the total units sampled.
Monitoring frequency	Annual or at least biennial as per the monitoring requirements in the methodology.
QA/QC procedures	As per the World Health Organizations Guidelines[34] it is more cost-effective and feasible to monitor indicator organisms such as E.coli. Monitoring of proxies such as E.coli, faecal coliform counts, chlorine levels may be used to assess *Water Quali*ty. Enumerators will be trained on proper testing procedures and the appropriate testing technology will be used
Purpose of data	Eligibility criteria and Emission Reduction calculations in Equation (1.a) or (1.b) Used in Equation (1.a) or (1.b) For Case 1: $QPW_y = \sum_0^i (T_{y,i} \times N_{y,i} \times R_{y,i} \times 365 \times Water\ Quality_i \times Operational\ Units_i)$ For Case 2: $QPW_y = \sum_0^i (X_{boil} \times T_{y,i} \times N_{y,i} \times R_{y,i} \times 365 \times Water\ Quality_i \times Operational\ Units_i)$
Additional comments	-

Data / Parameter	Operational Units
Unit	-

[34] WHO 'Guidelines for Drinking-water Quality, Fourth Edition
www.who.int/**water**_sanitation_health/publications/.../dwq_**guidelines**/ Page 41

Description	Monitoring to check the percentage of the monitoring period which units of each technology type are in use
Source of data	Sampling surveys
Value(s) applied	Refer to specific CPA
Measurement methods and procedures	Surveys will be conducted on sample of units per each technology type. The survey will then determine what percentage of days of the monitoring period the unit is in use by the end user. The mean of the percentage of operational days of the monitoring period of the samples will be applied for the parameter for each technology type.
Monitoring frequency	At least once per verification or biennially as per the monitoring requirements in the methodology.
QA/QC procedures	In the case that the unique serial number is no longer visible enumerators will inquire as to the date of purchase of the unit to ensure that the unit is not a replacement. If the specific unit selected for monitoring has been replaced it will be marked as out of use and deemed to be operational for 0% of the relevant monitoring period. Enumerators will be trained as to proper procedures to assess the percentage of the monitoring period which the unit is used.
Purpose of data	Emission reductions calculations Used in Equation (1.a) or (1.b), see section D.6.1
Additional comments	-

Data / Parameter	$f_{NRB,y}$
Unit	-
Description	Fraction of woody biomass used in the absence of the project activity in year *y* that can be established as non-renewable
Source of data	EB 67 Annex 22 Default Values for Fraction of Non-Renewable Biomass for Least Developed Countries and Small Island Developing States, combined with survey, national, or regional data to determine the percent of users using woody biomass and fossil fuel in the baseline scenario. If the displaced fuel is fossil fuel use the default value of 1.0. If a mixture of woody biomass and fossil fuels is used in the absence of the project activity a weighted average value should be used, using surveys or national data.
Value(s) applied	See Specific CPA
Measurement methods and procedures	The type of baseline fuel(s) used by target population will be determined via survey, national, or regional data. Parameter will be determined using the default values from EB67 Annex 22 for woody biomass and from the methodology for fossil fuels: If a mixture of woody biomass and fossil fuels is used in the absence of the project activity a weighted average value shall be applied, calculated through the following formula: $f_{NRB,y}$ = [Default f_{NRB} value] * [% of users using NRB] + [1.0] * [% of users using fossil fuels]
Monitoring frequency	Continuously or at least biennial as per the monitoring requirements in the methodology.
QA/QC procedures	Enumerators will be trained as to proper procedures to assess the baseline stove that is being or would have been used to boil water.
Purpose of data	Calculation of baseline emissions
Additional comment	Use of national data for the type of baseline fuel used is appropriate if the CPA covers the entire boundary of the host country. In case CPAs cover specific portions of the country, regional government data may be used to ensure more conservative and accurate representation of the target populations.

Data / Parameter	η_{wb}
Unit	Fraction
Description	Efficiency of water boiling system being replaced
Source of data	Default values as per AMS-III.AV combined with survey, national, or regional data to determine the percent of users using different types of water boiling systems in the baseline scenario.
Value(s) applied	See Specific CPA

<table>
<tr><td>Measurement methods and procedures</td><td>The type of baseline water boiling systems used by target population will be determined via survey, national, or regional data.

Parameter will be determined using the following default values from AMS-III.AV:
<table><tr><th>Baseline Water Boiling System</th><th>Default Efficiency Value</th></tr><tr><td>Unimproved biomass burning stove (UBBS)</td><td>0.1</td></tr><tr><td>Other biomass burning stove (OBBS)</td><td>0.2</td></tr><tr><td>Fossil fuel stove (FFS)</td><td>0.5</td></tr></table>
If more than one system is encountered, a weighted average value shall be applied, calculated through formula below:

η_{wb} = [Default efficiency of UBBS] * [% of UBBS users] +
[Default efficiency of OBBS] * [% of OBBS users] +
[Default efficiency of FFS] * [% of FFS users]</td></tr>
<tr><td>Monitoring frequency</td><td>Continuously or at least biennial as per the monitoring requirements in the methodology.</td></tr>
<tr><td>QA/QC procedures</td><td>Enumerators will be trained as to proper procedures to assess the baseline stove that is being or would have been used to boil water.</td></tr>
<tr><td>Purpose of data</td><td>Calculation of baseline emissions</td></tr>
<tr><td>Additional comment</td><td>Use of national data to determine the proportion of people using each type of baseline water boiling system is appropriate if the CPA covers the entire boundary of the host country. In case CPAs cover specific portions of the country, regional government data may be used to ensure more conservative and accurate representation of the target populations.</td></tr>
</table>

Data / Parameter	$EF_{projected\_fossilfuel}$
Unit	tCO2/TJ
Description	Emission factor as per AMS-I.E procedures when NRB is displaced or the emission factor of the fossil fuel substituted
Source of data	AMS-I.E as referenced by AMS-III.AV Version 4 for f_{NRB} and IPCC default values for fossil fuels, combined with survey, national, or regional data to determine the percent of users using woody biomass and fossil fuel(s) in the baseline scenario.
Value(s) applied	See Specific CPA
Measurement methods and procedures	The type of baseline fuel used by target population will be determined via survey, national, or regional data. Parameter will be determined using the following default values from AMS-I.E as referenced by AMS-III.AV Version 4 and IPCC (2006): **Emission Factor for Baseline Fuels** / **Emissions Factor** / **Source** EF_{NRB} / 81.6 tCO2/TJ / AMS-I.E $EF_{NaturalGas}$ / 56.1 tCO2/TJ / IPCC In the PoA boundary of Rwanda and Uganda, the population uses either woody biomass or fossil fuel.[35,36] To apply a conservative estimate of CERs, all fossil fuel used is assumed to be Natural Gas as this fuel has the lowest emission factor. If a mixture of woody biomass and fossil fuels is used in the absence of the project activity a weighted average value shall be applied, calculated through the following formula: $EF_{projected\_fossilfuel}$ = [EF_{NRB}]*[% of users using NRB] + [$EF_{Natural\ Gas}$]*[% of users using Natural Gas] + [$EF_{Kerosene}$]*[% of users using Kerosene]
Monitoring frequency	Continuously or at least biennial as per the monitoring requirements in the methodology.
QA/QC procedures	Enumerators will be trained as to proper procedures to assess baseline fuel usage.
Purpose of data	Calculation of baseline emissions
Additional comment	Use of national data for the type of baseline fuel used is appropriate if the CPA covers the entire boundary of the host country. In case CPAs cover specific portions of the country, regional government data may be used to ensure more conservative and accurate representation of the target populations.

[35] Rwanda: Biomass Energy Strategy (BEST) Rwanda, RBESS, MININFRA, 2009
[36] Uganda: National Uganda National Household Survey 2009/2010

Data / Parameter	Existence of public distribution network of safe drinking water
Unit	-
Description	Existence of public distribution network of safe drinking water in year y
Source of data	Surveys and or updated credible national/local reports/letters/announcements in relation to the existence of water networks in the region
Value(s) applied	-
Measurement methods and procedures	Review of surveys or credible national/local reports/letters/announcements
Monitoring frequency	Annual or at least biennial as per the monitoring requirements in the methodology
QA/QC procedures	-
Purpose of data	Eligibility criteria
Additional comments	-

Data / Parameter	$EC_{PJ,j,y}$
Unit	MWh/yr
Description	Quantity of electricity consumed by the project electricity consumption source j in year y
Source of data	Manufacturers' specifications, surveys, or direct monitoring
Value(s) applied	Refer to Specific CPA
Choice of data or Measurement methods and procedures	As per the "Tool to calculate baseline, project, and/or leakage CO_2 emissions from electricity consumption" Version 1. Electricity Consumption may be directly monitored or Manufacturers' specifications may be used to calculate electricity consumed by assuming that the technology is operating 24 hours a day all year or applying manufacturers' specification to user reported operation hours
Monitoring frequency	Annual or at least biennial as per the monitoring requirements in the methodology.
QA/QC procedures	If surveys are conducted annually they will meet 90/10 confidence and precision, if they are conducted biennially they will meet 95/10 confidence and precision.
Purpose of data	Calculation of project emissions
Additional comment	To be considered only in the case the water purification device consumes electricity.

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

The monitoring procedures and sampling plan for the PoA is in-line with *AMS-III.AV low greenhouse gas emitting safe drinking water production systems* (Version 4) and the procedures outlined in paragraph 18 of the *Standard for Sampling and Surveys for CDM Project Activities and Programme of Activities* (EB 74, Annex 6), which refers to the *Guidelines for Sampling and Surveys for CDM Project Activities and Programme of Activities* (EB 75, Annex 8):

a) Sampling design
- *(i) Objectives and Reliability Requirements*
- *(ii) Target population*
- *(iii) Sampling method*
- *(iv) Sample size*
- *(v) Sampling frame*

b) Data to be collected
- *(i) Field measurements*
- *(ii) Quality Assurance/Quality control*
- *(iii) Analysis*

c) Implementation plan
d) Data Storage
e) Monitoring management

The above criteria are elaborated in the forthcoming paragraphs.

a) Sampling Design

Flexibility to apply cross-CPA sampling is critical for the feasibility of the proposed PoA due to the large number of CPAs envisaged. Cross-CPA sampling may only be conducted for CPAs of the same type to ensure homogeneity. The CME will define a sampling frame for each CPA type such that the homogeneity of the group can be expected to be sufficient to allow for cross-CPA sampling. The criteria for homogeneity across CPAs per EB 75 Annex 8 are listed in section *(v) Sampling Frame* below. A sampling approach may be set in a CPA, but as additional CPAs are included the sampling approach may change to enable cross-CPA sampling.

As a rule, the most appropriate confidence/precision levels required by the methodology AMS-III.AV (Version 4) and the Sampling Standard will be applied whenever sampling is undertaken. According to the Sampling Standard, 95/10 reliability is to be applied whenever sampling across a group of CPAs, which will typically be the case for this PoA. In the case of conducting CPA-specific sampling, the methodology AMS-III.AV (Version 4) requires 90/10 confidence/precision if annual sampling is applied, or 95/10 confidence/prevision if biennial (every two years) sampling is applied.

(i) Objectives and Reliability Requirements

The objective of the sampling effort will be to meet the monitoring requirements set forth in the methodologies AMS-III.AV (Version 4), as detailed in B.7.1 above. Monitoring will be carried out on an annual basis (or biennial for specific parameters when allowed by the methodology, see B.7.1.). As the PoA progresses and the number of CPAs increases, the sampling plan can apply to a group of CPAs as referred to in EB 75, Annex 8. This will be applicable to CPA types as long as homogeneity can be demonstrated. When homogeneity cannot be demonstrated the CME may monitor CPAs individually.
All monitoring shall be coordinated by the CME, Impact Carbon.

The parameters to be obtained by means of sampling are listed below:

Parameter	Estimated Parameter Value*
Water Quality$_i$	[0-100]%
Operational Units$_i$	[0-100]%
$EC_{PJ,j,y}$	[#] MWh/yr
$f_{NRB,y}$	[% of population using NRB, combined with default values]
η_{wb}	[% of each type of baseline stove usage, combined with default values]
$EF_{projected\_fossilfuel}$	[% of each type of baseline fuel, combined with default values]

*See specific-CPA.

Note that parameters $f_{NRB,y}$, η_{wb}, and $EF_{projected\_fossilfuel}$ shall be determined through default values combined with survey, national, or regional data. In case survey is chosen, the sampling plan described below shall apply.

(ii) Target Population

The target population for the application of monitoring procedure will be the institutions in which water purification systems have been installed, as identified through the centralised record-keeping Project Database managed by the CME. The database will include a unique identification number of the unit and end-user information including the location of the household. CPAs will be grouped by CPA type, and only CPAs of the same type and located in the same country may be sampled together.

(iii)Sampling method

See Section B.7.2 from Generic CPA 1, section *(iii) Sampling Method*.

(iv) Sample size

The sampling method, either simple random, stratified random sampling, or multi-stage sampling will be determined separately for each CPA, as described and justified below. The sample will be representative so that if multiple CPAs are grouped in the monitoring process the proportion of units sampled from each CPA will equal the proportion of total units in operation in the various CPAs, and 95/10 will be achieved for cross-CPA monitoring. If monitoring occurs on an annual basis for an individual CPA then any representative sampling will satisfy the 90/10 confidence/precision requirement. If monitoring occurs every two years for an individual CPA then any representative sampling will satisfy the 95/10 confidence/precision requirement. If the required level of accuracy (confidence/precision) is not achieved, the sample size can be expanded.

1. Simple random sampling may be used for monitoring all of the sampled parameters when the following conditions exist (as outlined in the table below). Justification for the use of this approach for each parameter is provided in table below:

Parameter	Justification/Assumptions for Simple Random Sampling
Water Quality$_i$	One technology and target group type; Devices not widely dispersed geographically
Operational Units$_i$	One technology and target group; Devices not widely dispersed geographically
$EC_{PJ,j,y}$	One technology and target group; Devices not widely dispersed geographically
η_{wb}	Devices not widely dispersed geographically (technology type/target group not applicable as parameter refers to baseline scenario)
$f_{NRB,y}$	Same as η_{wb}
$EF_{projected\_fossilfuel}$	Same as η_{wb}

Sample size is determined for Proportional Values under simple random sampling using:

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

Where:

n = Sample Size
N = Total Number of Households
p = Expected proportion
1.645 = Represents the 90% confidence interval (1.96 represents the 95% confidence interval)
0.1 = Represents the 10% relative precision

Sample size is determined for a Mean Value under simple random sampling using:

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

Where:

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

Where:

n = Sample Size
N = Total Number of Households
mean = Mean
SD = Standard deviation
1.645 = Represents the 90% confidence interval (1.96 represents the 95% confidence interval)
0.1 = Represents the 10% relative precision

2. Stratified random sampling may be used when the following conditions exist (as outlined in the table below). Stratified sampling is used to account for differences in technologies and/or target groups within one CPA. In the case that one CPA has a single technology type, but multiple distinct target group, i.e. restaurants and villages, the strata would be the target group. Therefore the strata shall be the technology type and/or the target group.

Parameter	Justification/Assumptions for Stratified Random Sampling
Water Quality$_i$	Multiple technology types and/or target groups
Operational Units$_i$	Multiple technology types and/or target groups
$EC_{PJ,j,y}$	Multiple technology types and/or target groups
η_{wb}	Multiple target groups only, stratification by technology type only is not applicable as parameter refers to baseline scenario
$f_{NRB,y}$	Same as η_{wb}
$EF_{projected\_fossilfuel}$	Same as η_{wb}

Sample size is determined for Proportional Values under stratified random sampling using:

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

Where: $V = \frac{SD^2}{\overline{p}^2} = \frac{\text{overall variance}}{\overline{p}^2}$ and $\overline{p}$ is the overall proportion.

Where:

n = Total sample size
1.645 = Represents the 90% confidence interval (1.96 represents the 95% confidence interval)
0.1 = Represents the 10% relative precision

Where:

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

Where:

n_i = Sample size of the i^{th} group, where i=1,..,k
g_i = Size of the i^{th} group, where i=1,..,k
N = Population total

Where:

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

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

Where:

p_i = Proportion for the i^{th} group, where i=1,…,k

Using above equations, the total sample size (n) is calculated. The total sample size must be divided into the sample size for each group, i.e. each technology type. This division of the total sample size is calculated through the following equation:

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

Sample size is determined for a Mean Value under stratified random sampling using:

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

Where:

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

Where:

n	Sample Size
N	= Total Number of Households
mean	= Mean
SD	= Overall Standard deviation
1.645	= Represents the 90% confidence interval (1.96 represents the 95% confidence interval)
0.1	= Represents the 10% relative precision

Where:

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

Where:

SD	= Weighted overall standard deviation (SD_i Standard Deviation of the i^{th} group where i=1…,k
g_a	= Size of the i^{th} group where i=1,…,k
N	= Population total

Where:

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

Where:

mean	= Weighted overall mean
m_i	= Mean of the i^{th} group where i=1,…,k

Using above equations, the total sample size (n) is calculated. The total sample size must be divided into the sample size for each group, i.e. each technology type. This division of the total sample size is calculated through the following equation:

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

In order to establish the sample size (the number of groups to be sampled) using the above formulas, the following parameters must be known:

- the total number of strata in the population
- the average units per strata
- an estimate of the proportion/mean
- an estimate of the variance within each strata

3. Multi-stage sampling may also be used when the following conditions exist (as outlined in the table below). Multi-stage sampling consists of selecting primary clusters units and sampling from the secondary sampling units. The primary sampling units shall be administrative clusters, i.e. district, region, county, or village [to be determined at specific CPA]. The secondary sampling unit shall be the units.

Parameter	Justification/Assumptions for Multi-stage Sampling
$Water\ Quality_i$	Devices widely dispersed geographically
$Operational\ Units_i$	Devices widely dispersed geographically
$EC_{PJ,j,y}$	Devices widely dispersed geographically
η_{wb}	Devices widely dispersed geographically – use same location for baseline
$f_{NRB,y}$	Same as η_{wb}
$EF_{projected\_fossilfuel}$	Same as η_{wb}

Sample size is determined for proportional values under multi-stage sampling using:

$$c \geq \frac{\frac{SD_B^2}{\overline{p}^2} \times \frac{M}{M-1} + \frac{1}{\overline{u}} \times \frac{SD_w^2}{\overline{p}^2} \times \frac{(\overline{N}-\overline{u})}{(\overline{N}-1)}}{\frac{0.1^2}{1.645^2} + \frac{1}{M-1} \times \frac{SD_B^2}{\overline{p}^2}}$$

Where:

c	Number of groups that should be sampled
M	Total number of groups in the population
$\overline{u}$	Number of units to be sampled within each group
$\overline{N}$	Average units per group
SD_B^2	Unit variance
SD_W^2	Average of the group variances
$\overline{p}$	Overall proportion
1.645	Represents the 90% confidence interval (1.96 represents the 95% confidence interval)
0.1	Represents the 10% relative precision

Sample size is determined for mean values under multi-stage sampling using:

$$c \geq \frac{\left(\frac{SD_B}{Clustermean}\right)^2 \times \left(\frac{M}{M-1}\right) + \left(\frac{1}{u}\right) \times \left(\frac{SD_W}{Overallmean}\right)^2 \left(\frac{\overline{N}-u}{\overline{N}-1}\right)}{\left(\frac{0.1}{1.645}\right)^2 + \frac{1}{M-1}\left(\frac{SD_B}{Clustermean}\right)^2}$$

Where:

c	= Number of groups that should be sampled
M	= Total number of groups in the population
$\underline{u}$	= Number of units to be sampled within each group
$\bar{N}$	= Average units per group
SD_B	= Standard deviation between groups
SD_W	= Average within group standard deviation
Clustermean	= The cluster or group mean
Overall mean	= The average across all households
1.645	= Represents the 90% confidence required (1.96 for 95% confidence)
0.1	= Represents the 10% relative precision

The precision and expected variance is established in accordance with the recommended values by UNFCCC[37], namely 95% precision and 10% expected variance, for cross-CPA sampling.

In order to establish the sample size (the number of groups to be sampled) using the above formulas, the following parameters must be known:
- the total number of groups in the population
- the average units per group
- an estimate of the proportion/mean
- an estimate of the variance between and within groups

The sample size calculation will be automated in an Excel spreadsheet so that different scenarios may be estimated.

If the sample size calculation returns a value of less than 30 samples, a minimum of 30 samples will be conducted.

(v) Sampling frame

See Section B.7.2 from Generic CPA 1, section *(v) Sampling frame*.

c) Data to be collected

(i) Field measurements

Field measurement objectives and data to be collected are listed in section B.7.1. The parameters to be sampled within each CPA will depend on if the project activity is deemed to be Case 1 or Case 2, as outlined below.

For each CPA, the following parameters are determined through sampling:

a) *Water Quality*
b) *Operational Units*
c) $EC_{PJ,j,y}$
d) η_{wb}
e) $f_{NRB,y}$
f) $EF_{projected\_fossilfuel}$

Parameters will be obtained using sampling and will meet 90/10 confidence precision when sampled as a single CPA and 95/10 confidence and precision when sampled across CPAs or if monitoring is conducted on a biennial (every two years) basis.

[37] Standard for Sampling and Surveys for CDM Project Activities and Programme of Activities (EB 74, Annex 6).

For CPAs that fall under Case 2 (e.g. more than 60% of the target population have access to clean drinking water), ex-ante surveys are undertaken to establish:

g) X_{boil} - the proportion of total population for which the common practice of water purification is or would have been water boiling;

The CPA monitoring draws on information from the electronic data management system. The CME will operate and manage an electronic data management system that will store information on and track all technologies under the PoA. The system will contain the following information:

- Volume of units disseminated under the PoA
- Technology type for each unit
- Unique Identification Number for each unit
- Name, address, and contact information of the end-user (where possible)
- Date of installation (where possible)
- CPA assignment

The date of installation for each unit is used to determine the portion of the monitoring period during which the unit was active. Products deployed under the project activity are assumed be in operation as of the start of the next month following the date of sale, i.e. if the date of sale is April 1st, the start of operation is May 1st.

Monitoring will ensure the water quality of the water treated by the products employed under each CPA, as required under AMS-III.AV (Version 4). It shall be demonstrated that the application of the project technology/equipment achieves compliance with "protective"[38] or interim WHO performance targets as per "Evaluating households water treatment options: Health based targets and microbiological performance specifications" (WHO, 2011) or a comparable national standard or guideline. As per the World Health Organizations Guidelines[39] it is more cost-effective and feasible to monitor indicator organisms such as E.coli. Monitoring of proxies such as E.coli, faecal coliform counts, chlorine levels may be used to assess water quality. Enumerators will be trained on proper testing procedures and the appropriate testing technology will be used.

Upon installation of the water purification units, and associated accessories, the user will sign a Sales Receipt. For units that are not self-installed, a Sales Receipt will be signed upon commissioning. The sales and installation persons shall be responsible for ensuring that all data are complete and accurate within respective documents. Hard copies of both documents will be kept at the office of the CME, and all data entered into a central record keeping database.

The record keeping database will be used to record the results of all monitoring, thereby avoiding double counting, with all data stored to be kept for at least two years after the crediting period or the last issuance of CERs for the project activity. The data will be stored electronically in the database, with original hard copies of all collected monitoring data also kept.

(ii) Quality Assurance/Quality Control

See Section B.7.2 from Generic CPA 1, section *(ii) Quality Assurance/Quality Control*.

[38] Protective default performance target is defined by a 2 $\log_{10}$ reduction of bacteria, a 3 $\log_{10}$ reduction of viruses and a 2 $\log_{10}$ reduction of protozoa ("protective"). The reference pathogens shall be C. Jejuni, C*R*yptosporidium, and rotavirus.

[39] WHO 'Guidelines for Drinking-water Quali*T*y, Fourth Edition www.who.int/**water**_sanitation_health/publications/.../dwq_**guidelines**/ Page 41

(iii) Analysis
See Section B.7.2 from Generic CPA 1, section *(iii) Analysis*.

(c) Implementation Plan
See Section B.7.2 from Generic CPA 1, section *(c) Implementation Plan.*

(d) Data storage
See Section B.7.2 from Generic CPA 1, section *(d) Data storage.*

(e) Monitoring Management
See Section B.7.2 from Generic CPA 1, section *(e) Monitoring Management*.

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PART II. Generic component project activity

CPA type 4: Technologies for community water consumption, with no project emissions

SECTION A. General description of a generic CPA
A.1. Purpose and general description of generic CPAs

The significant majority of communities in [Host Country] lack access to potable water [add reference]. While many people do not treat their water at all, due to insufficient resources or lack of knowledge about the need, [X %], relying on boiling to purify water [add reference]. With this practice pervasive throughout the country, the health and environmental impacts are widespread and severe: it results in significant greenhouse gas (GHG) emissions through the use of non-renewable fuelwood, causes deforestation, threatens biodiversity, and can create an economic hardship for families to access clean drinking water. Families that purify water through boiling are left vulnerable to the negative effects of poor indoor air quality while those that do not boil, or only boil occasionally, suffer from waterborne diseases. Together, exposure to the harmful pollutants generated from traditional stoves and diseases induced from drinking non-treated water are responsible for over 5 million deaths globally per year, 1.5 million and 3.5 million respectively (WHO 2005;WHO 2008). In [Host Country] indoor air pollution contributed to [X] annual deaths and another [X] are caused by diarrheal diseases each year. [add reference]
The purpose of this CPA is to provide access to clean water technologies that achieve water quality levels equivalent to boiled water.

The CPA Implementer, CME, and various local partners work together to distribute the following specific technologies to communities within the CPA boundary of [specify boundary]:

- Water Kiosks,
- Water Filters,
- Solar Disinfection,
- Chemical Disinfection,
- Ultraviolet with renewable power (such systems shall only be installed in institutions that lack access to reliable energy supply)

The CME provides CPA implementers and local partners with access to clean water purification technologies. CPA implementers and partners leverage or create local distribution channels of [specify distribution channel, which may vary by CPA implementer, but may include direct sales,etc.] to reach communities with water purification technologies. Carbon revenues are used to subsidize the cost of distribution and/or of the product.

The CPA Implementer adheres to the CME management system (section C of the PoA-DD) and provides the CME with information required to include the project activity under the PoA and perform monitoring and verification of the activity.

SECTION B. Application of a baseline and monitoring methodology

B.1. Reference of the approved baseline and monitoring methodology(ies) selected

See Section B.1 in Generic CPA 1.

B.2. Application of methodology(ies)

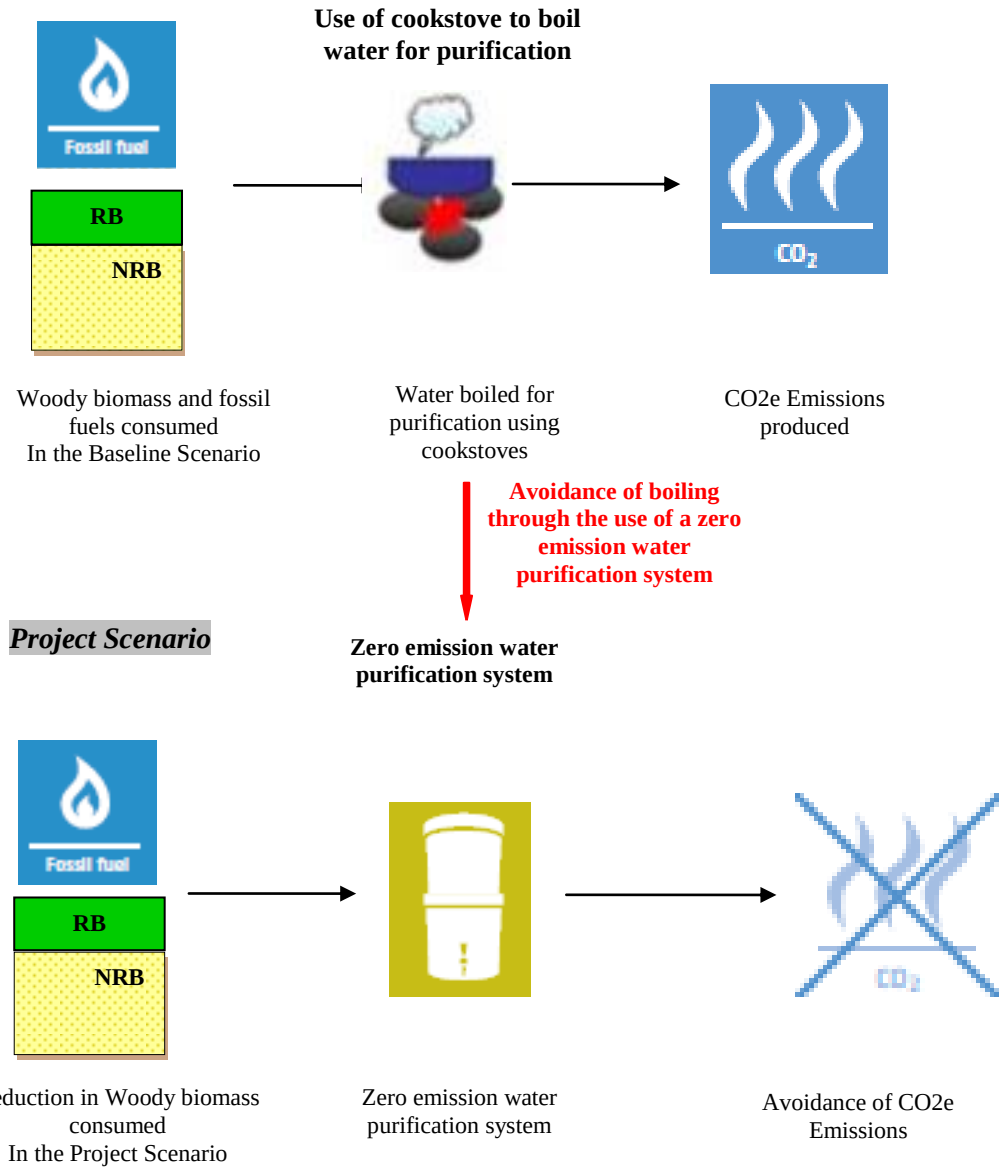
See Section B.2 in Generic CPA 1.

B.3. Sources and GHGs

The project boundary includes the physical, geographical sites of the low greenhouse gas emitting technologies for water purification installed by the project activity.

Source		Gas	Included?	Justification/Explanation
Baseline Scenario	Combustion of non-renewable biomass	CO_2	Yes	Major source of emissions
		CH_4	No	Minor source of emissions and limited data available. This is conservative.
		N_2O	No	Minor source of emissions and limited data available. This is conservative.
Project Scenario	Not applicable (no project emissions)	CO_2	No	N/A – no project emissions in CPA type 4
		CH_4	No	N/A – no project emissions in CPA type 4
		N_2O	No	N/A – no project emissions in CPA type 4

Flow Diagram



B.4. Description of baseline scenario

See Section B.4 in Generic CPA 1

B.5. Demonstration of eligibility for a generic CPA

The eligibility criteria for inclusion of a CPA in the PoA are based on the *Standard for Demonstration of Additionality, Development of Eligibility Criteria and Application of Multiple Methodologies for Programme Activities* (version 03.0), Annex 05 of EB 74

The verifiable evidence presented in the 'CPA Indicator' column below is exemplary. The CPA implementer may choose which evidence to provide to confirm compliance with the eligibility criteria, and not all evidence provided in the column must be submitted as long as the evidence is sufficient to prove eligibility.

Criteria Number	Eligibility Criteria	Description	CPA Indicator

	Category		
1	Location	All water purification systems in each CPA are located within the geographical boundaries of Rwanda or Uganda.	❑ [tick when met] _____ Verifiable evidence: – Geographical reference points of borders in section A.7 of the CPA-DD.
2	Double Counting	Each water purification system has a unique serial number and programme logo engraved or permanently attached as a nameplate or sticker. The serial numbers are listed in the CPA Project database and recorded in the Sales Receipt. [*and*] The name of each end-user (or individual who purchased product for institution or community center) will be recorded as part of the Sales Receipt and CPA Project Database. The address will be recorded if possible, alternatively other means of locating the unit such as GPS can be used. [*and*] The CME has an agreement in place with owner of each individual water purification system in the CPA in which the owner transfers the rights to the emissions reductions exclusively to the CME as part of the Carbon Rights Waiver within the Sales Receipt. [*and*] The CME has an agreement in place with each technology supplier in which it is stated that the supplier transfers the rights to the emissions reductions of each water purification system exclusively to the CME.	❑ [tick when met] See Section C of the PoA-DD _____ Verifiable evidence: – Operations Manual, documented procedures. – Example of sales receipt/CRW – Agreement with technology supplier(s)
3	Technology	Each CPA will employ water purification systems that are point-of-use or point-of-entry treatment systems, and are in line with criterion 7). Technologies that use fossil fuels are not eligible. Each unit must achieve water quality defined in relevant national standards or international guidelines for drinking water quality. The technologies must meet minimum criteria for specific CPA type, as outlined below: *CPA type 4:Technologies for community water consumption, no project emissions* - Minimum flow rate: 1 L/hr or one dose treating 5 l - Minimum capacity/lifespan: 4000 L or 1 year - Fixed or portable: Portable or Fixed - Removal of E.coli: 99 (2-log) - Minimum Watts/Voltage: N/A - User must lack access to reliable electricity	❑ [tick when met] _____ Verifiable evidence: – Technological specifications of technology

		supply.	
4	Start Date	Each CPA will prove that the start date of the CPA is on or after the start date of the PoA, which is stated in section D.1 of the PoA-DD. The start date of the CPA is the date on which the first water purification systems to be included in the CPA are ordered from the manufacturer. This is the earliest date at which real action of the program activity was taken, on which the CME committed expenditures related to implementation with the purchase of the first units for the project activity. This is documented in the purchase order or contract agreement with the technology supplier.	❑ [tick when met] _____ Verifiable evidence: – Purchase order to technology supplier – Contract with technology supplier
5	Methodology	Each CPA will apply the baseline and monitoring methodology AMS-III.AV (Version 4). The CPA will introduce water purification systems to provide safe drinking water to households, institutions and/or communities.	❑ [tick when met] _____ Verifiable evidence: – Technological specifications document(s)
6	Methodology	Prior to the implementation of the project activity, a public distribution network of safe drinking water did not exist within the project boundary. If, during the crediting period, any users are provided with safe drinking water through a public distribution network, these users will be removed from the CPA. This will be monitored annually or at least biennially.	❑ [tick when met] _____ Verifiable evidence: – Feasibility study or – National reports or – Official publications (e.g. from WHO) or – Water quality Tests or – Interviews with public officials, NGOs, end-users –
7	Methodology	The water purification technology/equipment must achieve compliance with either: (g) a relevant national standard or (h) The interim performance targets as per "Evaluating household water treatment options: Health based targets and microbiological performance specifications" (WHO, 2011)	❑ [tick when met] _____ Verifiable evidence: – Laboratory test report and/or official notifications (e.g. from national

			authority on health). – Technical specifications document(s)
8	Methodology	In the case that the life span of water treatment technologies is less than the length of the crediting period, all users (or individual who purchased product for institution or community center) will be provided with the contact details (phone number, email address and name) of the CME/CPA Implementer from whom replacement systems can be obtained via the Sales Receipt. The contact information provided for the CME or CPA implementer is a mobile number which is registered to the company and should not change. However, if a change is made to the contact information, (a) all users (or individual who purchased product for institution or community center) for whom contact information was collected will receive notification via SMS with updated information and/or (b) upon calling the original mobile number, caller shall be redirected to the updated contact. At the time of sale, sales representative will explain that the user can contact the CME or CPA implementer at any time when they need to purchase a replacement system. With this information, users are ensured a means of accessing replacement purification systems of comparable quality.	❑ [tick when met] _____ Verifiable evidence: – Sales Receipt template
9	Additionality	Additionality of CPA shall be confirmed in line with the requirements of '*Guidelines on the Demonstration of Additionality of Small-Scale Project Activities'* (Attachment A to Appendix B) (version 09.0). In each CPA-DD it shall be demonstrated that: - the water purification system installed is operating as an isolated unit. - the users of the water purification systems are either households, institutions, or communities - the size of each unit is no larger than 5% of the small-scale CDM threshold or 3,000 tCO2e reduced per year	❑ [tick when met] _____ – Sales Receipt template for specifying user group - Sales receipt template specifying user group - Emissions Reductions calculations spreadsheet demonstrating ERs per unit

10	Local Stakeholder Consultation	A local stakeholder consultation has been carried out for the CPA.	❑ [tick when met] Verifiable evidence: – Local stakeholder consultation report
11	Environmental impact analysis (EIA)	An environmental impact analysis (EIA) has been carried out for the CPA, or evidence is provided that the programme activities are exempt from an EIA.	❑ [tick when met] Verifiable evidence: – EIA report or – EIA exemptions notice from the government
12	Public Funding	A written confirmation from the CPA Implementer has confirmed that no funding from Annex 1 parties has been used for this CPA [or] If used, a written confirmation from the donor confirms that this did not result in a diversion of official development assistance (ODA).	❑ [tick when met] Verifiable evidence: – Written confirmation from CPA implementer – If funding from Annex I parties was used, written confirmation from donor that it did not result in a diversion of ODA
13	Target Group	The target group will be Households, institutions or communities, as defined by the CPA type: CPA type 4: Communities Target group is recorded in the Sales Receipt, to be distributed according to mechanisms described in section A.2, including direct sales and sales through distribution partners.	❑ [tick when met] Verifiable evidence: – Operations Manual – Contract with CPA Implementer or distribution partner – Technology type
14	Sampling requirements	The sampling method applied in the CPA (e.g. in the monitoring plan) follows the *Standard for Sampling and Surveys for CDM Project Activities and*	❑ [tick when met] Verifiable

		Programme of Activities (EB 74, Annex 6). A minimum 90% confidence interval and a 10% margin of error requirement is achieved for the sampled parameters. When a single sampling plan covers a group of CPAs or when monitoring is conducted biennially (every two years), confidence/precision of 95/10 for the sample size calculation is applicable.	evidence: – Sampling plan
15	Size Limit	The CPA's annual emissions reduction in aggregate remains below the small-scale limit of 60,000 tCO_2e reduced per annum throughout the crediting period.	❑ [tick when met] _____ Verifiable evidence: – Emissions reduction calculation spreadsheet
16	De-Bundling	The proposed CPA of the PoA is not a debundled component of a large scale activity because: Each of the independent subsystems/measures included in the CPA of a PoA is no larger than 1% of the small-scale thresholds defined by the applied methodology (i.e. not exceeding 600tCO_2e for SSC type III methodologies).	❑ [tick when met] _____ Verifiable evidence: – Emissions reduction calculation spreadsheet

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

B.6.1. Explanation of methodological choices

The following equations and methodological choices shall be applied for calculating baseline emissions, project emissions, leakage emissions, and emission reductions to each generic CPA as per the methodology AMS-III.AV, Version 04:

Baseline emissions shall be calculated as follows:

$$BE_y = QPW_y \times SEC \times f_{NRB,y} \times EF_{projected\ \_\ fossilfuel} \times 10^{-9}$$ Equation (1)

Where:

BE_y	Baseline emissions during the year *y* in (tCO_2e)
QPW_y	Quantity of purified water in year *y* (Liters/yr). Calculation of QPW_y is demonstrated in Equations (1.a) and (1.b) below.
SEC	Specific energy consumption required to boil one litre of water (kJ/L) Calculation of SEC is demonstrated in Equation (2) below.
$f_{NRB,y}$	Fraction of woody biomass used in the absence of the project activity in year y that can be established as non-renewable.

	For biomass, the default values of f_{NRB} shall be used from EB67. A survey, national, or regional data is conducted to determine the mix of fuels (% of biomass, % of other fuels) used in the baseline. If a mixture of biomass and other fuels (e.g. fossil fuels) are used, a weighted average renewability factor shall be applied.
$EF_{projected\_fossilfuel}$	Emission factor when NRB is displaced or the emission factor of the fossil fuel substituted Default emission factors from AMS-I.E as referenced in AMS-III.AV version 4 and IPCC (2005) shall be used. A survey, national, or regional data is conducted to determine the mix of fuels (% of biomass, % of other fuels) used in the baseline. If a mixture of woody biomass and fossil fuels are used in the absence of the project activity a weighted average value shall be applied, as described in parameter box in section B.7.1

The quantity of purified water in year *y* (QPW_y) shall be calculated using Equation (1.a) for Case 1 and Equation (1.b) for Case 2 as demonstrated below. These equations follow paragraph 11 of the methodology that allows project participants to determine the amount of purified water and the amount of drinking water per person per day through direct monitoring.

Case 1:

$$QPW_y = \sum_{0}^{i} (T_{y,i} \times R_{y,i} \times 365 \times Water\ Quality_i \times Operational\ Units_i)$$

Equation (1.a)

QPW_y is the sum of the quantity of purified water for drinking for all technologies type *i*.

Where:

$T_{y,i}$	Total distributed water purification systems (number of units). The product of $T_{y,i}$ and $R_{y,i}$ is the maximum amount of drinking water purified per person per day for all units of technology type *i*.
$R_{y,i}$	Average volume of drinking water per person per day (Liters/person/day) $R_{y,i}$ shall be directly monitored. As explained in parameter box in section B.7.1, only water purified for drinking purposes shall be used for the parameter.
Water Quality$_i$	Percent of units that meet water quality requirements *Water Quality*$_i$ parameter is used to modify $T_{y,i}$ such that only the proportion of units that meet required water quality standards out of the total sampled units shall be applied in calculation of QPW_y.
Operational Units$_i$	Percent of the monitoring period in which the units are in use *Operational Units*$_i$ parameter is used to modify $T_{y,i}$, such that only such that only the mean proportion of the monitoring period that the units are in use shall be applied in calculation

	of QPW_y. If multiple technology types are included, monitoring would measure parameter for each type of technology separately, as explained in monitored parameters section B.7.1.

Case 2:
For CPAs that fall under Case 2 (e.g. more than 60% of the target population have access to clean drinking water), ex-ante surveys are undertaken to establish the proportion of total population for which the common practice of water purification is or would have been water boiling, per paragraph 11 of the methodology.

$$QPW_y = \sum_{0}^{i} (X_{boil} \times T_{y,i} \times R_{y,i} \times 365 \times Water\ Quality_i \times Operational\ Units_i)$$

Equation (1.b)

Where:

$X_{boil,i}$	The proportion of total population for which the common practice of water purification is or would have been water boiling (percentage) Parameter is required to adjust for the fraction of the population serviced by the project equipment at households/buildings for which it can be demonstrated through documentation or survey that the practice of water purification would have been water boiling, as stated in the methodology. Ex-ante surveys are undertaken to establish this value.
$T_{y,i}$	Total distributed water purification systems (number of units). The product of $T_{y,i}$ and $R_{y,i}$ is the maximum amount of drinking water purified per person per day for all units of technology type i.
$R_{y,i}$	Average volume of drinking water per person per day (Liters/person/day) $R_{y,i}$ shall be directly monitored. As explained in parameter box in section B.7.1, only water purified for drinking purposes shall be used for the parameter.
Water Quality$_i$	Percent of units that meet water quality requirements *Water Quality*$_i$ parameter is used to modify T_y such that only the proportion of units that meet required water quality standards out of the total sampled units shall be applied in calculation of QPW_y.
Operational Units$_i$	Percent of the monitoring period in which the units are in use *Operational Units*$_i$ parameter is used to modify $T_{y,i}$, such that only such that only the mean proportion of the monitoring period that the units are in use shall be applied in calculation of QPW_y. If multiple technology types are included, monitoring would measure parameter for each type of technology separately, as explained in monitored parameters section B.7.1.

The specific energy consumption [SEC] required to boil one litre of water shall be calculated as follows:

$$SEC = \left[WH \times \left(T_f - T_i\right) + 0.01 \times WHE\right]/n_{wb} \quad \text{Equation (2)}$$

Where:

WH	Specific heat of water (kJ/L ^{o}C)
T_f	Final temperature (^{o}C)
T_i	Initial temperature of water (^{o}C)
WHE	Latent heat of water evaporation (kJ/L)
η_{wb}	Efficiency of water boiling system being replaced (fraction) The CPA Implementer will provide information on the baseline technology (i.e. system being replaced) to determine the value for η_{wb}, the efficiency value of the water boiling system. The type of baseline water boiling system used by target population will be determined via survey or national data. The efficiency value for the system being replaced will be determined using the following default values from the methodology: **Baseline Water Boiling System** / **Default Efficiency Value** Unimproved biomass burning stove / 0.1 Other biomass burning stove / 0.2 Fossil fuel stove / 0.5 If more than one system is encountered, a weighted average of values will be applied.

Emissions Reductions shall be calculated using Equation (3) below. This equation is in line with methodology with incorporation of leakage as adjustment to baseline emissions and the application of PEy, as explained below.

$$ER_y = (BE_y \times L - PE_y) \quad \text{Equation (3)}$$

Where:

ER_y	Emissions reductions during the year *y* in tCO_2e
BE_y	Baseline emissions from the use of non-renewable biomass (NRB) to boil water as a means of water purification, calculated in Equation (1) above.
L	Leakage factor to account for non-renewable woody biomass (fraction). Leakage relating to the non-renewable woody biomass is assessed as per the relevant procedures of AMS-I.E, as allowed by AMS-III.AV. The default value of 0.95 is applied to account for leakage.
PE_y	Project emissions from onsite consumption of fossils or electricity due to the project activity. As CPA type does not use fossil fuels or electricity, PE_y is zero.

B.6.2. Data and parameters that are to be reported ex-ante

(Copy this table for each data and parameter.)

Data / Parameter	Case1 or Case 2
Unit	-
Description	Case 1 or Case 2: Project activities implemented in rural or urban areas of countries with proportion of rural or urban population using an improved drinking-water source equal to or less than 60 % (Case1) or above 60% (Case2).
Source of data	Survey or literature (For survey sampling refer to the sampling section of the monitoring plan under B.7.2)
Value(s) applied	[Case 1 or Case 2]
Choice of data or Measurement methods and procedures	Case 1 and Case 2 will be determined using one of the three options below: (i) Proportion of populations using an improved drinking-water source for the most recent year for which data is available from WHO/UNICEF Joint Monitoring Programme (JMP) for Water Supply and Sanitation shall be used (<http://www.wssinfo.org/data-estimates/table/>) for this purpose. Definition of improved and unimproved drinking water source shall be as per the information provided by JMP; (ii) Using official data such as publicly available statistical data from a government agency or an independently commissioned study by an international organization or an university; (iii) Using survey methods (use 90/10 confidence/precision for sampling).
Purpose of data	Determination of Case 1 or Case 2 for baseline and opting for appropriate emission reductions calculations methods
Additional comment	-

[The following parameter, X_{boil}, will only be included if the CPA falls under Case 2.]

Data / Parameter	X_{boil}
Unit	Fraction
Description	The proportion of total population for which the common practice of water purification is or would have been water boiling;
Source of data	Survey or literature (For survey sampling refer to the sampling section of the monitoring plan under B.7.2)
Value(s) applied	Refer to specific CPA
Choice of data or Measurement methods and procedures	Ex-ante surveys or literature will measure this parameter.
Purpose of data	Calculation of Case 2 baseline emissions
Additional comment	Applicable only to Case 2

Data / Parameter	WH
Unit	Kj/L ^{o}C
Description	Specific Heat of Water
Source of data	Default Value from AMS-III.AV Version 4
Value(s) applied	4.186
Choice of data or Measurement methods and procedures	-
Purpose of data	Calculation of baseline emissions
Additional comment	-

Data / Parameter	T_f
Unit	^{o}C
Description	Final Temperature
Source of data	Default Value from AMS-III.AV Version 4
Value(s) applied	100
Choice of data or Measurement methods and procedures	-
Purpose of data	Calculation of baseline emissions
Additional comment	-

Data / Parameter	T_i
Unit	^{o}C
Description	Initial Temperature
Source of data	Default Value from AMS-III.AV Version 4
Value(s) applied	20
Choice of data or Measurement methods and procedures	-
Purpose of data	Calculation of baseline emissions
Additional comment	-

Data / Parameter	WHE
Unit	Kj/L
Description	Latent Heat of Water Evaporation
Source of data	Default Value from AMS-III.AV Version 4
Value(s) applied	2,260
Choice of data or Measurement methods and procedures	-
Purpose of data	Calculation of baseline emissions
Additional comment	-

Data / Parameter	L
Unit	-
Description	Leakage
Source of data	Default Value from AMS-I.E Version 5
Value(s) applied	.95
Choice of data or Measurement methods and procedures	Methodological default
Purpose of data	Calculation of leakage emissions
Additional comment	-

B.6.3. Ex-ante calculations of emission reductions

[In this section, each CPA-DD will demonstrate calculation of ex-ante emission reductions pertaining to the specific CPA and CPA type using the methodological equations demonstrated in section B.6.1 above. A generic tabulated emission reduction format is provided below.]

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

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

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

(Copy this table for each data and parameter)

QPW_y, the total volume of drinking water produced by technologies under the CPA is calculated through Equation (1.a) or (1.b) in the PoA-DD document, therefore parameters $T_{y,i}$, and $R_{y,i}$ need to be monitored, a value of 5.5 litres per person per day shall not be exceeded.

Data / Parameter	QPW_y
Unit	Liters/yr
Description	Quantity of purified water in year *y* (litres)
Source of data	Calculation
Value(s) applied	Refer to specific CPA
Measurement methods and procedures	Calculated through Equation (1.a) or (1.b) For Case 1: $QPW_y = \sum_0^i (T_{y,i} \times R_{y,i} \times 365 \times Water\ Quality_i \times Operational\ Units_i)$ For Case 2: $QPW_y = \sum_0^i (X_{boil} \times T_{y,i} \times R_{y,i} \times 365 \times Water\ Quality_i \times Operational\ Units_i)$
Monitoring frequency	Annual or at least biennial as per the monitoring requirements in the methodology
QA/QC procedures	-
Purpose of data	Calculation of baseline emissions
Additional comments	-

Data / Parameter	$T_{y,i}$
Unit	units
Description	Total distributed water purification systems
Source of data	Sales invoices database
Value(s) applied	Refer to specific CPA
Measurement methods and procedures	The total number of units by technology type and date deployed in each specific CPA is tracked in the in the Project Database, using Sales Receipts. All units distributed will be recorded. Any unit not recorded in the Project Database will not be credited for emission reductions.
Monitoring frequency	Continuous
QA/QC procedures	Sales Database is cross-checked with paper records to ensure transparent and robust data. Replacement units will be captured in monitoring the number of *Operational Units*$_i$.
Purpose of data	Calculation of QPW_y Used in equation (1.a) or (1.b), see section D.6.1
Additional comments	-

Data / Parameter	$R_{y,i}$
Unit	Liters/unit/day
Description	Average volume of drinking water per unit per day
Source of data	Direct monitoring of a representative sample
Value(s) applied	Refer to Specific CPA
Choice of data or Measurement methods and procedures	Directly monitored using quantitative surveys or measurements of a representative sample. Survey shall ensure that only drinking water is measured, water purified and used for other purposes shall be excluded.
Monitoring frequency	Annual or at least biennial as per the monitoring requirements in the methodology
QA/QC procedures	$N_{y,i}$ multiplied by $R_{y,i}$ shall not exceed the maximum output of the technology [per unit]. Enumerators shall be trained to ensure accurate calculation of purified water and assessment of purified water used for drinking.
Purpose of data	Calculation of QPW_y Used in equation (1.a) or (1.b), see section D.6.1
Additional comments	Per the methodology, if the calculation of QPW_y is based on the average volume of drinking water per person per day, a value of 5.5 litres per person per day shall not be exceeded.

Data / Parameter	$N_{y,i}$
Unit	Persons/unit
Description	The average population serviced by water purification systems
Source of data	Surveys
Value(s) applied	Refer to Specific CPA
Measurement methods and procedures	The number of people using the unit will be monitored.
Monitoring frequency	At least biennial per methodology
QA/QC procedures	$N_{y,i}$ multiplied by $R_{y,i}$ shall not exceed the maximum output of the technology [per unit].
Purpose of data	Used for capping the treated water consumed at 5.5 litres per person per day per paragraph 6 of the methodology.
Additional comments	-

Data / Parameter	Water Quality
Unit	[proportion]
Description	Water quality measurement
Source of data	Sampling surveys
Value(s) applied	Refer to specific CPA
Measurement methods and procedures	Water Quality testing will be done on sample of units per each technology type. After samples are chosen, a dedicated water container will be taken to the location where the system is installed to take a sample of the cleaned water for testing using the appropriate testing technology. Water quality is defined in a relevant national standard or guidelines for drinking water quality. An indicator may be monitored to assess whether samples meet these requirements. In case a national standard / guideline for drinking water quality is not available, the interim performance targets as per "Evaluating household water treatment options: Health based targets and microbiological performance specifications" (WHO, 2011). Each unit is deemed to meet relevant standards or not. The parameter is a proportion of units of the specific technology type that meet standards out of the total units sampled.
Monitoring frequency	Annual or at least biennial as per the monitoring requirements in the methodology.
QA/QC procedures	As per the World Health Organizations Guidelines[40] it is more cost-effective and feasible to monitor indicator organisms such as E.coli. Monitoring of proxies such as E.coli, faecal coliform counts, chlorine levels may be used to assess Water Quality. Enumerators will be trained on proper testing procedures and the appropriate testing technology will be used.
Purpose of data	Eligibility criteria and Emission Reduction calculations For Case 1: $QPW_y = \sum_0^i (T_{y,i} \times R_{y,i} \times 365 \times Water\ Quality_i \times Operational\ Units_i)$ For Case 2: $QPW_y = \sum_0^i (X_{boil} \times T_{y,i} \times R_{y,i} \times 365 \times Water\ Quality_i \times Operational\ Units_i)$
Additional comments	-

[40] WHO 'Guidelines for Drinking-water QualiT_y, Fourth Edition
www.who.int/**water**_sanitation_health/publications/.../dwq_**guidelines**/ Page 41

Data / Parameter	*Operational Units*
Unit	-
Description	Monitoring to check the percentage of the monitoring period which units of each technology type are in use
Source of data	Sampling surveys
Value(s) applied	Refer to specific CPA
Measurement methods and procedures	Surveys will be conducted on sample of units per each technology type. The survey will then determine what percentage of days of the monitoring period the unit is in use by the end user. The mean of the percentage of operational days of the monitoring period of the samples will be applied for the parameter for each technology type. In this CPA type, Operational Units will further confirm that unit is being used according to technical specifications, i.e. if it is a UV system connected to a solar panel, it shall not be connected to any electricity supply other than the Solar PV panel/system supplied with the unit. If the unit is not used according to specifications, it shall be deemed to be not in operation from the beginning of the monitoring period and deemed to be operational for 0% of the relevant monitoring period. This shall be determined through the monitoring of a sample of solar powered devices; the fraction of units found using any energy source other than the Solar PV panel/system supplied with the unit and considered not in use shall be applied to the full population of UV systems connected to solar panels.
Monitoring frequency	At least once per verification or biennially as per the monitoring requirements in the methodology.
QA/QC procedures	In the case that the unique serial number is no longer visible enumerators will inquire as to the date of purchase of the unit to ensure that the unit is not a replacement. If the specific unit selected for monitoring has been replaced it will be marked as out of use and deemed to be operational for 0% of the relevant monitoring period. Enumerators will be trained as to proper procedures to assess the percentage of the monitoring period which the unit is used.
Purpose of data	Emission reductions calculations Used in equation (1.a) or (1.b), see section D.6.1
Additional comments	-

Data / Parameter	$f_{NRB,y}$
Unit	-
Description	Fraction of woody biomass used in the absence of the project activity in year *y* that can be established as non-renewable
Source of data	EB 67 Annex 22 Default Values for Fraction of Non-Renewable Biomass for Least Developed Countries and Small Island Developing States, combined with survey, national, or regional data to determine the percent of users using woody biomass and fossil fuel in the baseline scenario. If the displaced fuel is fossil fuel use the default value of 1.0. If a mixture of woody biomass and fossil fuels is used in the absence of the project activity a weighted average value should be used, using surveys or national data.
Value(s) applied	See Specific CPA
Measurement methods and procedures	The type of baseline fuel(s) used by target population will be determined via survey, national, or regional data. Parameter will be determined using the default values from EB67 Annex 22 for woody biomass and from the methodology for fossil fuels: If a mixture of woody biomass and fossil fuels is used in the absence of the project activity a weighted average value shall be applied, calculated through the following formula: $f_{NRB,y}$ = [Default f_{NRB} value] * [% of users using NRB] + [1.0] * [% of users using fossil fuels]
Monitoring frequency	Continuously or at least biennial as per the monitoring requirements in the methodology.
QA/QC procedures	Enumerators will be trained as to proper procedures to assess the baseline stove that is being or would have been used to boil water.
Purpose of data	Calculation of baseline emissions
Additional comment	Use of national data for the type of baseline fuel used is appropriate if the CPA covers the entire boundary of the host country. In case CPAs cover specific portions of the country, regional government data may be used to ensure more conservative and accurate representation of the target populations.

Data / Parameter	η_{wb}
Unit	Fraction
Description	Efficiency of water boiling system being replaced
Source of data	Default values as per AMS-III.AV combined with survey, national, or regional data to determine the percent of users using different types of water boiling systems in the baseline scenario.
Value(s) applied	See Specific CPA

<table>
<tr><td>Measurement methods and procedures</td><td>The type of baseline water boiling systems used by target population will be determined via survey, national, or regional data.

Parameter will be determined using the following default values from AMS-III.AV:
<table><tr><th>Baseline Water Boiling System</th><th>Default Efficiency Value</th></tr><tr><td>Unimproved biomass burning stove (UBBS)</td><td>0.1</td></tr><tr><td>Other biomass burning stove (OBBS)</td><td>0.2</td></tr><tr><td>Fossil fuel stove (FFS)</td><td>0.5</td></tr></table>
If more than one system is encountered, a weighted average value shall be applied, calculated through formula below:

η_{wb} = [Default efficiency of UBBS] * [% of UBBS users] +
[Default efficiency of OBBS] * [% of OBBS users] +
[Default efficiency of FFS] * [% of FFS users]</td></tr>
<tr><td>Monitoring frequency</td><td>Continuously or at least biennial as per the monitoring requirements in the methodology.</td></tr>
<tr><td>QA/QC procedures</td><td>Enumerators will be trained as to proper procedures to assess the baseline stove that is being or would have been used to boil water.</td></tr>
<tr><td>Purpose of data</td><td>Calculation of baseline emissions</td></tr>
<tr><td>Additional comment</td><td>Use of national data to determine the proportion of people using each type of baseline water boiling system is appropriate if the CPA covers the entire boundary of the host country. In case CPAs cover specific portions of the country, regional government data may be used to ensure more conservative and accurate representation of the target populations.</td></tr>
</table>

Data / Parameter	$EF_{projected\_fossilfuel}$
Unit	tCO2/TJ
Description	Emission factor as per AMS-I.E procedures when NRB is displaced or the emission factor of the fossil fuel substituted
Source of data	AMS-I.E as referenced by AMS-III.AV Version 4 for f_{NRB} and IPCC default values for fossil fuels, combined with survey, national, or regional data to determine the percent of users using woody biomass and fossil fuel(s) in the baseline scenario.
Value(s) applied	See Specific CPA
Measurement methods and procedures	The type of baseline fuel used by target population will be determined via survey, national, or regional data. Parameter will be determined using the following default values from AMS-I.E as referenced by AMS-III.AV Version 4 and IPCC (2006): **Emission Factor for Baseline Fuels** / **Emissions Factor** / **Source** EF_{NRB} / 81.6 tCO2/TJ / AMS-I.E $EF_{NaturalGas}$ / 56.1 tCO2/TJ / IPCC In the PoA boundary of Rwanda and Uganda, the population uses either woody biomass or fossil fuel.[41,42] To apply a conservative estimate of CERs, all fossil fuel used is assumed to be Natural Gas as this fuel has the lowest emission factor. If a mixture of woody biomass and fossil fuels is used in the absence of the project activity a weighted average value shall be applied, calculated through the following formula: $EF_{projected\_fossilfuel}$ = [EF_{NRB}]*[% of users using NRB] + [$EF_{Natural\ Gas}$]*[% of users using Natural Gas] + [$EF_{Kerosene}$]*[% of users using Kerosene]
Monitoring frequency	Continuously or at least biennial as per the monitoring requirements in the methodology.
QA/QC procedures	Enumerators will be trained as to proper procedures to assess baseline fuel usage.
Purpose of data	Calculation of baseline emissions
Additional comment	Use of national data for the type of baseline fuel used is appropriate if the CPA covers the entire boundary of the host country. In case CPAs cover specific portions of the country, regional government data may be used to ensure more conservative and accurate representation of the target populations.

Data / Parameter	Existence of public distribution network of safe drinking water
Unit	-
Description	Existence of public distribution network of safe drinking water in year y

[41] Rwanda: Biomass Energy Strategy (BEST) Rwanda, RBESS, MININFRA, 2009
[42] Uganda: National Uganda National Household Survey 2009/2010

Source of data	Surveys and or updated credible national/local reports/letters/announcements in relation to the existence of water networks in the region
Value(s) applied	-
Measurement methods and procedures	Review of surveys or credible national/local reports/letters/announcements
Monitoring frequency	Annual or at least biennial as per the monitoring requirements in the methodology
QA/QC procedures	-
Purpose of data	Eligibility criteria
Additional comments	-

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

The monitoring procedures and sampling plan for the PoA is in-line with *AMS-III.AV low greenhouse gas emitting safe drinking water production systems* (Version 4) and the procedures outlined in paragraph 18 of the *Standard for Sampling and Surveys for CDM Project Activities and Programme of Activities* (EB 74, Annex 6), which refers to the *Guidelines for Sampling and Surveys for CDM Project Activities and Programme of Activities* (EB 75, Annex 8):

a) Sampling design
  (i) Objectives and Reliability Requirements
  (ii) Target population
  (iii) Sampling method
  (iv) Sample size
  (v) Sampling frame
b) Data to be collected
  (i) Field measurements
  (ii) Quality Assurance/Quality control
  (iii) Analysis
c) Implementation plan
d) Data Storage
e) Monitoring management

The above criteria are elaborated in the forthcoming paragraphs.

a) Sampling Design

Flexibility to apply cross-CPA sampling is critical for the feasibility of the proposed PoA due to the large number of CPAs envisaged. Cross-CPA sampling may only be conducted for CPAs of the same type to ensure homogeneity. The CME will define a sampling frame for each CPA type such that the homogeneity of the group can be expected to be sufficient to allow for cross-CPA sampling. The criteria for homogeneity across CPAs per EB 75 Annex 8 are listed in section *(v) Sampling Frame* below. A sampling approach may be set in a CPA, but as additional CPAs are included the sampling approach may change to enable cross-CPA sampling.

As a rule, the most appropriate confidence/precision levels required by the methodology AMS-III.AV (Version 4) and the Sampling Standard will be applied whenever sampling is undertaken. According to the Sampling Standard, 95/10 reliability is to be applied whenever sampling across a group of CPAs, which will typically be the case for this PoA. In the case of conducting CPA-specific sampling, the methodology AMS-III.AV (Version 4) requires 90/10 confidence/precision if annual sampling is applied, or 95/10 confidence/prevision if biennial (every two years) sampling is applied.

(i) Objectives and Reliability Requirements

The objective of the sampling effort will be to meet the monitoring requirements set forth in the methodologies AMS-III.AV (version 4), as detailed in B.7.1 above. Monitoring will be carried out on an annual basis (or biennial for specific parameters when allowed by the methodology, see B.7.1.). As the PoA progresses and the number of CPAs increases, the sampling plan can apply to a group of CPAs as referred to in EB 75, Annex 8. This will be applicable to CPA types as long as homogeneity can be demonstrated. When homogeneity cannot be demonstrated the CME may monitor CPAs individually.
All monitoring shall be coordinated by the CME, Impact Carbon.

The parameters to be obtained by means of sampling are listed below:

Parameter	Estimated Parameter Value*
$N_{y,i}$	[#]
$R_{y,i}$	[#]
$Water\ Quality_i$	[0-100]%
$Operational\ Units_i$	[0-100]%
$f_{NRB,y}$	[% of population using NRB, combined with default values]
η_{wb}	[% of each type of baseline stove usage, combined with default values]
$EF_{projected\_fossilfuel}$	[% of each type of baseline fuel, combined with default values]

*See specific-CPA.

Note that parameters $f_{NRB,y}$, η_{wb}, and $EF_{projected\_fossilfuel}$ shall be determined through default values combined with survey, national, or regional data. In case survey is chosen, the sampling plan described below shall apply.

(ii) Target Population

The target population for the application of monitoring procedure will be the community centers, including restaurants, villages, offices, or health centers, in which water purification systems have been installed, as identified through the centralised record-keeping Project Database managed by the CME. The database will include a unique identification number of the unit and end-user information including the location of the household. CPAs will be grouped by CPA type, and only CPAs of the same type and located in the same country may be sampled together.

(iii) Sampling method

See Section B.7.2 from Generic CPA 1, section *(iii) Sampling Method*.

(iv) Sample size

The sampling method, either simple random, stratified random sampling, or multi-stage sampling will be determined separately for each CPA, as described and justified below. The sample will be representative so that if multiple CPAs are grouped in the monitoring process the proportion of units sampled from each CPA will equal the proportion of total units in operation in the various CPAs, and 95/10 will be achieved for cross-CPA monitoring. If monitoring occurs on an annual basis for an individual CPA then any representative sampling will satisfy the 90/10 confidence/precision requirement. If monitoring occurs every two years for an individual CPA then any representative sampling will satisfy the 95/10 confidence/precision requirement. If the required level of accuracy (confidence/precision) is not achieved, the sample size can be expanded.

1. Simple random sampling may be used for monitoring all of the sampled parameters when the following conditions exist (as outlined in the table below). Justification for the use of this approach for each parameter is provided in table below:

Parameter	Justification/Assumptions for Simple Random Sampling
$N_{y,i}$	One technology and target group type; Devices not widely dispersed geographically
$R_{y,i}$	One technology and target group type; Devices not widely dispersed geographically
Water Quality$_i$	One technology and target group; Devices not widely dispersed geographically
Operational Units$_i$	One technology and target group; Devices not widely dispersed geographically
η_{wb}	Devices not widely dispersed geographically (technology type not applicable as parameter refers to baseline scenario)
$f_{NRB,y}$	Same as η_{wb}
$EF_{projected\_fossilfuel}$	Same as η_{wb}

Sample size is determined for Proportional Values under simple random sampling using:

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

Where:

n = Sample Size
N = Total Number of Households
p = Expected proportion
1.645 = Represents the 90% confidence interval (1.96 represents the 95% confidence interval)
0.1 = Represents the 10% relative precision

Sample size is determined for a Mean Value under simple random sampling using:

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

Where:

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

Where:

n = Sample Size
N = Total Number of Households
mean = Mean
SD = Standard deviation
1.645 = Represents the 90% confidence interval (1.96 represents the 95% confidence interval)
0.1 = Represents the 10% relative precision

2. Stratified random sampling may be used when the following conditions exist (as outlined in the table below). Stratified sampling is used to account for differences in technologies and/or target groups within one CPA. In the case that one CPA has a single technology type, but multiple distinct target group, i.e. restaurants and villages, the strata would be the target group. Therefore the strata shall be the technology type and/or the target group.

Parameter	Justification/Assumptions for Stratified Random Sampling
$N_{y,i}$	Multiple technology types and/or target groups
$R_{y,i}$	Multiple technology types and/or target groups
Water Quality$_i$	Multiple technology types and/or target groups
Operational Units$_i$	Multiple technology types and/or target groups
η_{wb}	Multiple target groups only, stratification by technology type only is not applicable as parameter refers to baseline scenario
$f_{NRB,y}$	Same as η_{wb}
$EF_{projected\_fossilfuel}$	Same as η_{wb}

Sample size is determined for Proportional Values under stratified random sampling using:

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

Where: $V = \frac{SD^2}{\overline{p}^2} = \frac{\text{overall variance}}{\overline{p}^2}$ and $\overline{p}$ is the overall proportion.

Where:

n = Total sample size
1.645 = Represents the 90% confidence interval (1.96 represents the 95% confidence interval)
0.1 = Represents the 10% relative precision

Where:

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

Where:

n_i = Sample size of the i^{th} group, where i=1,..,k
g_i = Size of the i^{th} group, where i=1,..,k
N = Population total

Where:

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

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

Where:

p_i = Proportion for the i^{th} group, where i=1,…,k

Using above equations, the total sample size (n) is calculated. The total sample size must be divided into the sample size for each group, i.e. each technology type. This division of the total sample size is calculated through the following equation:

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

Sample size is determined for a Mean Value under stratified random sampling using:

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

Where:

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

Where:

n	Sample Size
N	= Total Number of Households
mean	= Mean
SD	= Overall Standard deviation
1.645	= Represents the 90% confidence interval (1.96 represents the 95% confidence interval)
0.1	= Represents the 10% relative precision

Where:

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

Where:

SD	= Weighted overall standard deviation (SD_i Standard Deviation of the i^{th} group where i=1…,k
g_a	= Size of the i^{th} group where i=1,…,k
N	= Population total

Where:

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

Where:

mean = Weighted overall mean
m_i = Mean of the i^{th} group where i=1,…,k

Using above equations, the total sample size (n) is calculated. The total sample size must be divided into the sample size for each group, i.e. each technology type. This division of the total sample size is calculated through the following equation:

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

In order to establish the sample size (the number of groups to be sampled) using the above formulas, the following parameters must be known:
– the total number of strata in the population
– the average units per strata
– an estimate of the proportion/mean
– an estimate of the variance within each strata

3. Multi-stage sampling may also be used when the following conditions exist (as outlined in the table below). Multi-stage sampling consists of selecting primary clusters units and sampling from the secondary sampling units. The primary sampling units shall be administrative clusters, i.e. district, region, county, or village [to be determined at specific CPA]. The secondary sampling unit shall be the units.

Parameter	Justification/Assumptions for Multi-stage Sampling
$N_{y,i}$	Devices widely dispersed geographically
$R_{y,i}$	Devices widely dispersed geographically
Water Quality$_i$	Devices widely dispersed geographically
Operational Units$_i$	Devices widely dispersed geographically
η_{wb}	Devices widely dispersed geographically – use same location for baseline
$f_{NRB,y}$	Same as η_{wb}
$EF_{projected\_fossilfuel}$	Same as η_{wb}

Sample size is determined for proportional values under multi-stage sampling using:

$$c \geq \frac{\frac{SD_B^2}{\overline{p}^2} \times \frac{M}{M-1} + \frac{1}{\overline{u}} \times \frac{SD_w^2}{\overline{p}^2} \times \frac{(\overline{N} - \overline{u})}{(\overline{N} - 1)}}{\frac{0.1^2}{1.645^2} + \frac{1}{M-1} \times \frac{SD_B^2}{\overline{p}^2}}$$

Where:

c Number of groups that should be sampled
M Total number of groups in the population
$\overline{u}$ Number of units to be sampled within each group

$\overline{N}$	Average units per group
SD_B^2	Unit variance
SD_W^2	Average of the group variances
p	Overall proportion
1.645	Represents the 90% confidence interval (1.96 represents the 95% confidence interval)
0.1	Represents the 10% relative precision

Sample size is determined for mean values under multi-stage sampling using:

$$c \geq \frac{\left(\frac{SD_B}{Clustermean}\right)^2 \times \left(\frac{M}{M-1}\right) + \left(\frac{1}{u}\right) \times \left(\frac{SD_W}{Overallmean}\right)^2 \left(\frac{\overline{N}-u}{\overline{N}-1}\right)}{\left(\frac{0.1}{1.645}\right)^2 + \frac{1}{M-1}\left(\frac{SD_B}{Clustermean}\right)^2}$$

Where:

c	= Number of groups that should be sampled
M	= Total number of groups in the population
u	= Number of units to be sampled within each group
$\overline{N}$	= Average units per group
SD_B	= Standard deviation between groups
SD_W	= Average within group standard deviation
Clustermean	= The cluster or group mean
Overall mean	= The average across all households
1.645	= Represents the 90% confidence required (1.96 for 95% confidence)
0.1	= Represents the 10% relative precision

The precision and expected variance is established in accordance with the recommended values by UNFCCC[43], namely 95% precision and 10% expected variance, for cross-CPA sampling.

In order to establish the sample size (the number of groups to be sampled) using the above formulas, the following parameters must be known:
- the total number of groups in the population
- the average units per group
- an estimate of the proportion/mean
- an estimate of the variance between and within groups

The sample size calculation will be automated in an Excel spreadsheet so that different scenarios may be estimated.

If the sample size calculation returns a value of less than 30 samples, a minimum of 30 samples will be conducted.

(v) Sampling frame

See Section B.7.2 from Generic CPA 1, section *(v) Sampling frame*.

[43] Standard for Sampling and Surveys for CDM Project Activities and Programme of Activities (EB 74, Annex 6).

b) Data to be collected

(iii) Field measurements

Field measurement objectives and data to be collected are listed in section B.7.1. The parameters to be sampled within each CPA will depend on if the project activity is deemed to be Case 1 or Case 2, as outlined below.

For each CPA, the following parameters are determined through sampling:

a) $N_{y,i}$
b) $R_{y,i}$
c) $Water\ Quality_i$
d) $Operational\ Units_i$
e) η_{wb}
f) $f_{NRB,y}$
g) $EF_{projected\_fossilfuel}$

Parameters will be obtained using sampling and will meet 90/10 confidence precision when sampled as a single CPA and 95/10 confidence and precision when sampled across CPAs or if monitoring is conducted on a biennial (every two years) basis.

For CPAs that fall under Case 2 (e.g. more than 60% of the target population have access to clean drinking water), ex-ante surveys are undertaken to establish:

h) X_{boil} - the proportion of total population for which the common practice of water purification is or would have been water boiling

The CPA monitoring draws on information from the electronic data management system. The CME will operate and manage an electronic data management system that will store information on and track all technologies under the PoA. The system will contain the following information:

- Volume of units disseminated under the PoA
- Technology type for each unit
- Unique Identification Number for each unit
- Name, address, and contact information of the end-user (where possible)
- Date of installation (where possible)
- CPA assignment

The date of installation for each unit is used to determine the portion of the monitoring period during which the unit was active. Products deployed under the project activity are assumed be in operation as of the start of the next month following the date of sale, i.e. if the date of sale is April 1st, the start of operation is May 1st.

Monitoring will ensure the water quality of the water treated by the products employed under each CPA, as required under AMS-III.AV (Version 4). It shall be demonstrated that the application of the project technology/equipment achieves compliance with "protective"[44] or interim WHO performance targets as per "Evaluating households water treatment options: Health based targets and microbiological performance specifications" (WHO, 2011) or a comparable national standard or guideline. As per the

[44] Protective default performance target is defined by a 2 $\log_{10}$ reduction of bacteria, a 3 $\log_{10}$ reduction of viruses and a 2 $\log_{10}$ reduction of protozoa ("protective"). The reference pathogens shall be C. Jejuni, C*R*yptosporidium, and rotavirus.

World Health Organizations Guidelines[45] it is more cost-effective and feasible to monitor indicator organisms such as E.coli. Monitoring of proxies such as E.coli, faecal coliform counts, chlorine levels may be used to assess water quality. Enumerators will be trained on proper testing procedures and the appropriate testing technology will be used

Upon installation of the water purification units, and associated accessories, the user will sign a Sales Receipt. For units that are not self-installed, a Sales Receipt will be signed upon commissioning. The sales and installation persons shall be responsible for ensuring that all data are complete and accurate within respective documents. Hard copies of both documents will be kept at the office of the CME, and all data entered into a central record keeping database.

The record keeping database will be used to record the results of all monitoring, thereby avoiding double counting, with all data stored to be kept for at least two years after the crediting period or the last issuance of CERs for the project activity. The data will be stored electronically in the database, with original hard copies of all collected monitoring data also kept.

(iv) Quality Assurance/Quality Control

See Section B.7.2 from Generic CPA 1, section *(ii) Quality Assurance/Quality Control*.

(v) Analysis

See Section B.7.2 from Generic CPA 1, section *(iii) Analysis*.

(c) Implementation Plan

See Section B.7.2 from Generic CPA 1, section *(c) Implementation Plan.*

(d) Data storage

See Section B.7.2 from Generic CPA 1, section *(d) Data storage.*

(e) Monitoring Management

See Section B.7.2 from Generic CPA 1, section *(e) Monitoring Management*.

PART II. Generic component project activity

CPA type 5: Technologies for community water consumption, with project emissions

SECTION A. General description of a generic CPA

The application of the methodology and the inclusion criteria do not change for different measures/combinations of measures, thus the Generic component of the CPA is provided once.

A.1. Purpose and general description of generic CPAs

The significant majority of communities in [Host Country] lack access to potable water [add reference]. While many people do not treat their water at all, due to insufficient resources or lack of knowledge about the need, [X %], relying on boiling to purify water [add reference]. With this practice pervasive throughout the country, the health and environmental impacts are widespread and severe: it results in significant greenhouse gas (GHG) emissions through the use of non-renewable fuelwood, causes deforestation, threatens biodiversity, and can create an economic hardship for families to access clean

[45] WHO 'Guidelines for Drinking-water QualiT_y, Fourth Edition www.who.int/**water**_sanitation_health/publications/.../dwq_**guidelines**/ Page 41

drinking water. Families that purify water through boiling are left vulnerable to the negative effects of poor indoor air quality while those that do not boil, or only boil occasionally, suffer from waterborne diseases. Together, exposure to the harmful pollutants generated from traditional stoves and diseases induced from drinking non-treated water are responsible for over 5 million deaths globally per year, 1.5 million and 3.5 million respectively (WHO 2005;WHO 2008). In [Host Country] indoor air pollution contributed to [X] annual deaths and another [X] are caused by diarrheal diseases each year. [add reference] The purpose of this CPA is to provide access to clean water technologies that achieve water quality levels equivalent to boiled water.

The CPA Implementer, CME, and various local partners work together to distribute the following specific technologies to communities within the CPA boundary of [specify boundary]:

- Ultraviolet disinfection devices
- Reverse osmosis systems

The CME provides CPA implementers and local partners with access to clean water purification technologies. CPA implementers and partners leverage or create local distribution channels of [specify distribution channel, which may vary by CPA implementer, but may include direct sales,etc.] to reach communities with water purification technologies. Carbon revenues are used to subsidize the cost of distribution and/or of the product.

The CPA Implementer adheres to the CME management system (section C of the PoA-DD) and provides the CME with information required to include the project activity under the PoA and perform monitoring and verification of the activity.

SECTION B. Application of a baseline and monitoring methodology
B.1. Reference of the approved baseline and monitoring methodology(ies) selected

The CPA operates under *AMS-III.AV low greenhouse gas emitting safe drinking water production systems* (Version 4). The calculation of leakage refers to guidance from AMS-I.E. *Switch from non-renewable biomass for thermal applications by the user*, (Version 5), as noted below.

The CPA uses the "Tool to calculate baseline, project, and/or leakage CO_2 emissions from electricity consumption" (Version 1).

B.2. Application of methodology(ies)

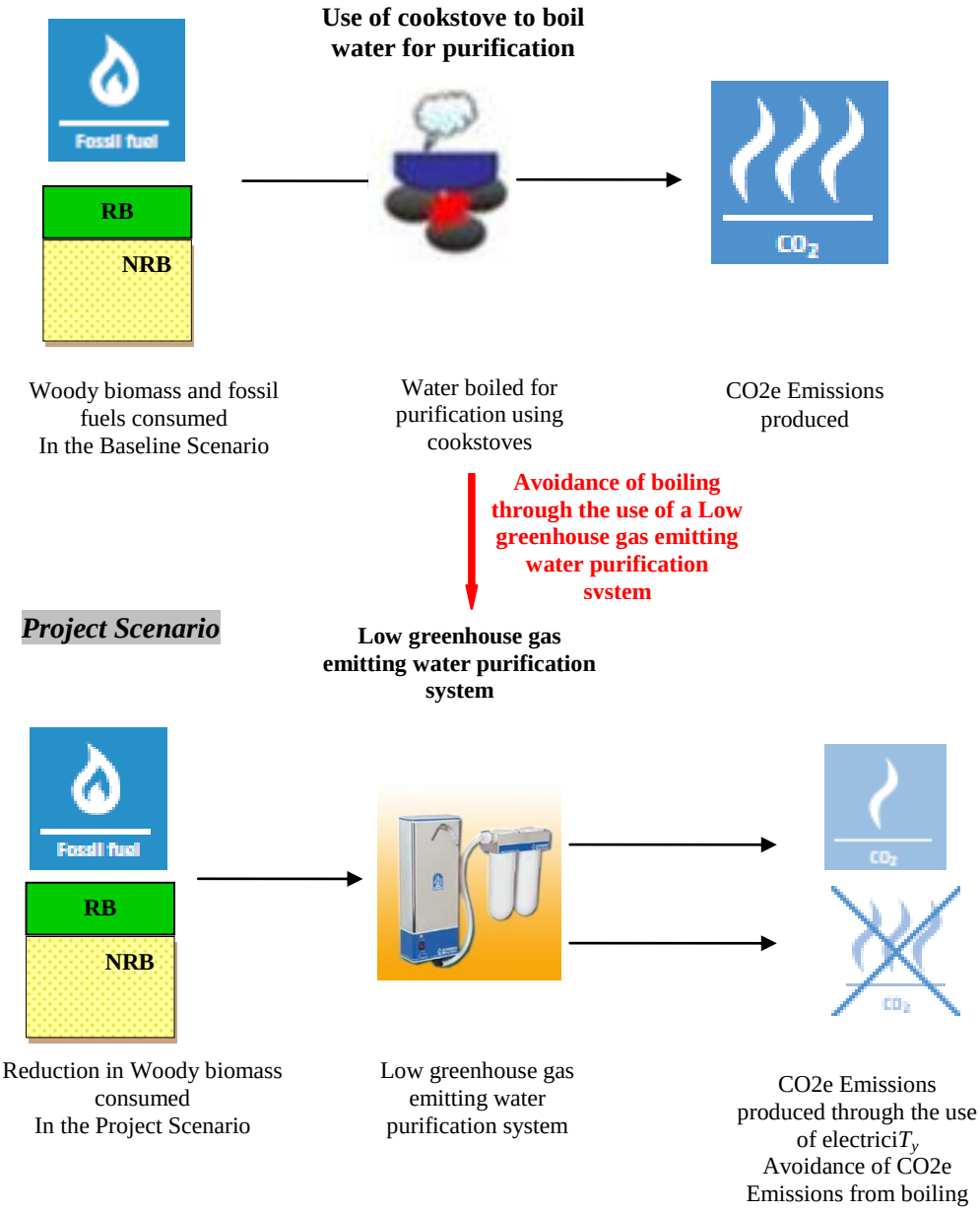
See Section B.2 in Generic CPA 1.

B.3. Sources and GHGs

The project boundary includes the physical, geographical sites of the low greenhouse gas emitting technologies for water purification installed by the project activity.

Source		Gas	Included?	Justification/Explanation
Baseline Scenario	Combustion of non-renewable biomass	CO_2	Yes	Major source of emissions
		CH_4	No	Minor source of emissions and limited data available. This is conservative.
		N_2O	No	Minor source of emissions and limited data available. This is conservative.
Project Scenario	Emissions from electricity usage for water purification technologies	CO_2	Yes	Major source of emissions
		CH_4	No	Minor source of emissions and limited data available
		N_2O	No	Minor source of emissions and limited data available

Flow Diagram



B.4. Description of baseline scenario

See Section B.4 in Generic CPA 1.

B.5. Demonstration of eligibility for a generic CPA

The eligibility criteria for inclusion of a CPA in the PoA are based on the *Standard for Demonstration of Additionality, Development of Eligibility Criteria and Application of Multiple Methodologies for Programme Activities* (version 03.0), Annex 05 of EB 74

The verifiable evidence presented in the 'CPA Indicator' column below is exemplary. The CPA implementer may choose which evidence to provide to confirm compliance with the eligibility criteria, and not all evidence provided in the column must be submitted as long as the evidence is sufficient to prove eligibility.

Criteria Number	Eligibility Criteria Category	Description	CPA Indicator
1	Location	All water purification systems in each CPA are located within the geographical boundaries of Rwanda or Uganda.	❑ [tick when met] _____ Verifiable evidence: – Geographical reference points of borders in section A.7 of the CPA-DD.
2	Double Counting	Each water purification system has a unique serial number and programme logo engraved or permanently attached as a nameplate or sticker. The serial numbers are listed in the CPA Project database and recorded in the Sales Receipt. [*and*] The name of each end-user (or individual who purchased product for institution or community center) will be recorded as part of the Sales Receipt and CPA Project Database. The address will be recorded if possible, alternatively other means of locating the unit such as GPS can be used. [*and*] The CME has an agreement in place with owner of each individual water purification system in the CPA in which the owner transfers the rights to the emissions reductions exclusively to the CME as part of the Carbon Rights Waiver within the Sales Receipt. [*and*] The CME has an agreement in place with each technology supplier in which it is stated that the supplier transfers the rights to the emissions reductions of each water purification system exclusively to the CME.	❑ [tick when met] See Section C of the PoA-DD _____ Verifiable evidence: – Operations Manual, documented procedures. – Example of sales receipt/CRW – Agreement with technology supplier(s)

3	Technology	Each CPA will employ water purification systems that are point-of-use or point-of-entry treatment systems, and are in line with criterion 7). Technologies that use fossil fuels are not eligible. Each unit must achieve water quality defined in relevant national standards or international guidelines for drinking water quality. The technologies must meet minimum criteria for specific CPA type, as outlined below: *CPA type 5: Technologies for community water consumption, with project emissions* - Minimum flow rate: 50 L/hr - Minimum capacity/lifespan: 219,000 L or 1 year - Fixed or portable: Fixed - Removal of E.coli: 99 (4-log) - Minimum Watts/Voltage: 5	❑ [tick when met] _____ Verifiable evidence: – Technological specifications of technology
4	Start Date	Each CPA will prove that the start date of the CPA is on or after the start date of the PoA, which is stated in section D.1 of the PoA-DD. The start date of the CPA is the date on which the first water purification systems to be included in the CPA are ordered from the manufacturer. This is the earliest date at which real action of the program activity was taken, on which the CME committed expenditures related to implementation with the purchase of the first units for the project activity. This is documented in the purchase order or contract agreement with the technology supplier.	❑ [tick when met] _____ Verifiable evidence: – Purchase order to technology supplier – Contract with technology supplier
5	Methodology	Each CPA will apply the baseline and monitoring methodology AMS-III.AV (Version 4). The CPA will introduce water purification systems to provide safe drinking water to households, institutions and/or communities.	❑ [tick when met] _____ Verifiable evidence: – Technological specifications document(s) –
6	Methodology	Prior to the implementation of the project activity, a public distribution network of safe drinking water did not exist within the project boundary. If, during the crediting period, any users are provided with safe drinking water through a public distribution network, these users will be removed from the CPA. This will be monitored annually or at least biennially.	❑ [tick when met] _____ Verifiable evidence: – Feasibility study or – National reports or – Official publications (e.g. from WHO) or – Water quality Tests or

			– Interviews with public officials, NGOs, end-users –
7	Methodology	The water purification technology/equipment must achieve compliance with either: (i) a relevant national standard or (j) The interim performance targets as per "Evaluating household water treatment options: Health based targets and microbiological performance specifications" (WHO, 2011)	❑ [tick when met] _____ Verifiable evidence: – Laboratory test report and/or official notifications (e.g. from national authority on health). – Technical specifications document(s)
8	Methodology	In the case that the life span of water treatment technologies is less than the length of the crediting period, all users (or individual who purchased product for institution or community center) will be provided with the contact details (phone number, email address and name) of the CME/CPA Implementer from whom replacement systems can be obtained via the Sales Receipt. The contact information provided for the CME or CPA implementer is a mobile number which is registered to the company and should not change. However, if a change is made to the contact information, (a) all users (or individual who purchased product for institution or community center) for whom contact information was collected will receive notification via SMS with updated information and/or (b) upon calling the original mobile number, caller shall be redirected to the updated contact. At the time of sale, sales representative will explain that the user can contact the CME or CPA implementer at any time when they need to purchase a replacement system. With this information, users are ensured a means of accessing replacement purification systems of comparable quality.	❑ [tick when met] _____ Verifiable evidence: – Sales Receipt template
9	Additionality	Additionality of CPA shall be confirmed in line with the requirements of '*Guidelines on the Demonstration of Additionality of Small-Scale Project Activities'* (Attachment A to Appendix B) (version 09.0). In each CPA-DD it shall be demonstrated that:	❑ [tick when met] _____ – Sales Receipt

		- the water purification system installed is operating as an isolated unit. - the users of the water purification systems are either households, institutions, or communities - the size of each unit is no larger than 5% of the small-scale CDM threshold or 3,000 tCO2e reduced per year	template for specifying user group - Sales receipt template specifying user group - Emissions Reductions calculations spreadsheet demonstrating ERs per unit
10	Local Stakeholder Consultation	A local stakeholder consultation has been carried out for the CPA.	❑ [tick when met] Verifiable evidence: – Local stakeholder consultation report
11	Environmental impact analysis (EIA)	An environmental impact analysis (EIA) has been carried out for the CPA, or evidence is provided that the programme activities are exempt from an EIA.	❑ [tick when met] Verifiable evidence: – EIA report or – EIA exemptions notice from the government
12	Public Funding	A written confirmation from the CPA Implementer has confirmed that no funding from Annex 1 parties has been used for this CPA [or] If used, a written confirmation from the donor confirms that this did not result in a diversion of official development assistance (ODA).	❑ [tick when met] Verifiable evidence: – Written confirmation from CPA implementer – If funding from Annex I parties was used, written confirmation from donor that it did not result in a diversion of ODA
13	Target Group	The target group will be Households, institutions or	❑ [tick when met]

		communities, as defined by the CPA type: CPA type 5: Communities Target group is recorded in the Sales Receipt, to be distributed according to mechanisms described in section A.2, including direct sales and sales through distribution partners.	_____ Verifiable evidence: – Operations Manual – Contract with CPA Implementer or distribution partner – Technology type
14	Sampling requirements	The sampling method applied in the CPA (e.g. in the monitoring plan) follows the *Standard for Sampling and Surveys for CDM Project Activities and Programme of Activities* (EB 74, Annex 6). A minimum 90% confidence interval and a 10% margin of error requirement is achieved for the sampled parameters. When a single sampling plan covers a group of CPAs or when monitoring is conducted biennially (every two years), confidence/precision of 95/10 for the sample size calculation is applicable.	❑ [tick when met] _____ Verifiable evidence: – Sampling plan
15	Size Limit	The CPA's annual emissions reduction in aggregate remains below the small-scale limit of 60,000 tCO_2e reduced per annum throughout the crediting period.	❑ [tick when met] _____ Verifiable evidence: – Emissions reduction calculation spreadsheet
16	De-Bundling	The proposed CPA of the PoA is not a debundled component of a large scale activity because: Each of the independent subsystems/measures included in the CPA of a PoA is no larger than 1% of the small-scale thresholds defined by the applied methodology (i.e. not exceeding 600tCO_2e for SSC type III methodologies).	❑ [tick when met] _____ Verifiable evidence: – Emissions reduction calculation spreadsheet

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

B.6.1. Explanation of methodological choices

The following equations and methodological choices shall be applied for calculating baseline emissions, project emissions, leakage emissions, and emission reductions to each generic CPA as per the methodology AMS-III.AV, Version 04:

Baseline emissions shall be calculated as follows:

$$BE_y = QPW_y \times SEC \times f_{NRB,y} \times EF_{projected\ \_\ fossilfuel} \times 10^{-9}$$

Equation (1)

Where:

BE_y	Baseline emissions during the year *y* in (tCO_2e)
QPW_y	Quantity of purified water in year *y* (Liters/yr). Calculation of QPW_y is demonstrated in Equations (1.a) and (1.b) below.
SEC	Specific energy consumption required to boil one litre of water (kJ/L) Calculation of SEC is demonstrated in Equation (2) below.
$f_{NRB,y}$	Fraction of woody biomass used in the absence of the project activity in year y that can be established as non-renewable. For biomass, the default values of f_{NRB} shall be used from EB67. A survey, national, or regional data is conducted to determine the mix of fuels (% of biomass, % of other fuels) used in the baseline. If a mixture of biomass and other fuels (e.g. fossil fuels) are used, a weighted average renewability factor shall be applied.
$EF_{projected\_fossilfuel}$	Emission factor when NRB is displaced or the emission factor of the fossil fuel substituted Default emission factors from AMS-I.E as referenced in AMS-III.AV version 4 and IPCC (2005) shall be used. A survey, national, or regional data is conducted to determine the mix of fuels (% of biomass, % of other fuels) used in the baseline. If a mixture of woody biomass and fossil fuels are used in the absence of the project activity a weighted average value shall be applied, as described in parameter box in section B.7.1

The quantity of purified water in year *y* (QPW_y) shall be calculated using Equation (1.a) for Case 1 and Equation (1.b) for Case 2 as demonstrated below. These equations follow paragraph 11 of the methodology that allows project participants to determine the amount of purified water and the amount of drinking water per person per day through direct monitoring.

Case 1:

$$QPW_y = \sum_0^i (T_{y,i} \times R_{y,i} \times 365 \times Water\ Quality_i \times Operational\ Units_i)$$

Equation (1.a)

QPW_y is the sum of the quantity of purified water for drinking for all technologies type *i*.

Where:

$T_{y,i}$	Total distributed water purification systems (number of units).

	The product of $T_{y,i}$ and $R_{y,i}$ is the maximum amount of drinking water purified per person per day for all units of technology type i.
$R_{y,i}$	Average volume of drinking water per person per day (Liters/person/day) $R_{y,i}$ shall be directly monitored. As explained in parameter box in section B.7.1, only water purified for drinking purposes shall be used for the parameter.
Water Quality$_i$	Percent of units that meet water quality requirements *Water Quality*$_i$ parameter is used to modify $T_{y,i}$ such that only the proportion of units that meet required water quality standards out of the total sampled units shall be applied in calculation of QPW_y.
Operational Units$_i$	Percent of the monitoring period in which the units are in use *Operational Units*$_i$ parameter is used to modify $T_{y,i}$, such that only such that only the mean proportion of the monitoring period that the units are in use shall be applied in calculation of QPW_y. If multiple technology types are included, monitoring would measure parameter for each type of technology separately, as explained in monitored parameters section B.7.1.

Case 2:
For CPAs that fall under Case 2 (e.g. more than 60% of the target population have access to clean drinking water), ex-ante surveys are undertaken to establish the proportion of total population for which the common practice of water purification is or would have been water boiling, per paragraph 11 of the methodology.

$$QPW_y = \sum_{0}^{i} (X_{boil} \times T_{y,i} \times R_{y,i} \times 365 \times Water\ Quality_i \times Operational\ Units_i)$$

Equation (1.b)

Where:

$X_{boil,i}$	The proportion of total population for which the common practice of water purification is or would have been water boiling (percentage) Parameter is required to adjust for the fraction of the population serviced by the project equipment at households/buildings for which it can be demonstrated through documentation or survey that the practice of water purification would have been water boiling, as stated in the methodology. Ex-ante surveys are undertaken to establish this value.
$T_{y,i}$	Total distributed water purification systems (number of units). The product of $T_{y,i}$ and $R_{y,i}$ is the maximum amount of drinking water purified per person per day for all units of technology type i.
$R_{y,i}$	Average volume of drinking water per person per day (Liters/person/day) $R_{y,i}$ shall be directly monitored. As explained in parameter box in section B.7.1, only water

	purified for drinking purposes shall be used for the parameter.
Water Quality$_i$	Percent of units that meet water quality requirements *Water Quality*$_i$ parameter is used to modify $T_{y,i}$ such that only the proportion of units that meet required water quality standards out of the total sampled units shall be applied in calculation of QPW_y.
Operational Units$_i$	Percent of the monitoring period in which the units are in use *Operational Units*$_i$ parameter is used to modify $T_{y,i}$, such that only such that only the mean proportion of the monitoring period that the units are in use shall be applied in calculation of QPW_y. If multiple technology types are included, monitoring would measure parameter for each type of technology separately, as explained in monitored parameters section B.7.1.

The specific energy consumption [SEC] required to boil one litre of water shall be calculated as follows:

$$SEC = \left[WH \times \left(T_f - T_i\right) + 0.01 \times WHE\right]/n_{wb} \qquad \text{Equation (2)}$$

Where:

WH	Specific heat of water (kJ/L ^{o}C)
T_f	Final temperature (^{o}C)
T_i	Initial temperature of water (^{o}C)
WHE	Latent heat of water evaporation (kJ/L)
η_{wb}	Efficiency of water boiling system being replaced (fraction) The CPA Implementer will provide information on the baseline technology (i.e. system being replaced) to determine the value for η_{wb}, the efficiency value of the water boiling system. The type of baseline water boiling system used by target population will be determined via survey or national data. The efficiency value for the system being replaced will be determined using the following default values from the methodology: **Baseline Water Boiling System** / **Default Efficiency Value** Unimproved biomass burning stove / 0.1 Other biomass burning stove / 0.2 Fossil fuel stove / 0.5 If more than one system is encountered, a weighted average of values will be applied.

Emissions Reductions shall be calculated using Equation (3) below. This equation is in line with methodology with incorporation of leakage as adjustment to baseline emissions and the application of PEy, as explained below.

$$ER_y = (BE_y \times L - PE_y)$$ Equation (3)

Where:

ER_y	Emissions reductions during the year *y* in tCO_2e
BE_y	Baseline emissions from the use of non-renewable biomass (NRB) to boil water as a means of water purification, calculated in Equation (1) above.
L	Leakage factor to account for non-renewable woody biomass (fraction). Leakage relating to the non-renewable woody biomass is assessed as per the relevant procedures of AMS-I.E, as allowed by AMS-III.AV. The default value of 0.95 is applied to account for leakage.
PE_y	Project emissions from onsite consumption of fossils or electricity due to the project activity. As CPA type involves consumption of electricity due to the project activity, calculation of PE_y is demonstrated in Equation (3.a) below.

Project emissions shall be calculated according to Equation (3.a). This equation follows the methodology, paragraph 14, advising calculation of CO2 emissions from electricity consumption by the project activity using the "Tool to calculate baseline, project, and/or leakage CO_2 emissions from electricity consumption" (Version 1).

$$PE_y = T_y \times EC_{PJ,j,y} \, x \, EF_{EL,j,y} \, x \left(1 + TDL_{j,y}\right)$$ Equation (3.a)

Where:

$T_{y,i}$	Total distributed water purification systems (number of units)
$EC_{PJ,j,y}$	Quantity of electricity consumed by the project electricity consumption source j in year y (MWh/yr)
$EF_{EL,j,y}$	Emission factor for electricity generation for source j in year *y* (tCO2/MWh)
$TDL_{j,y}$	Average technical transmission and distribution losses for providing electricity to source j in year y

B.6.2. Data and parameters that are to be reported ex-ante

(Copy this table for each data and parameter.)

Data / Parameter	Case1 or Case 2
Unit	-
Description	Case 1 or Case 2: Project activities implemented in rural or urban areas of countries with proportion of rural or urban population using an improved drinking-water source equal to or less than 60 % (Case1) or above 60% (Case2).
Source of data	Survey or literature (For survey sampling refer to the sampling section of the monitoring plan under B.7.2)
Value(s) applied	[Case 1 or Case 2]
Choice of data or Measurement methods and procedures	Case 1 and Case 2 will be determined using one of the three options below: (i) Proportion of populations using an improved drinking-water source for the most recent year for which data is available from WHO/UNICEF Joint Monitoring Programme (JMP) for Water Supply and Sanitation shall be used (<http://www.wssinfo.org/data-estimates/table/>) for this purpose. Definition of improved and unimproved drinking water source shall be as per the information provided by JMP; (ii) Using official data such as publicly available statistical data from a government agency or an independently commissioned study by an international organization or an university; (iii) Using survey methods (use 90/10 confidence/precision for sampling).
Purpose of data	Determination of Case 1 or Case 2 for baseline and opting for appropriate emission reductions calculations methods
Additional comment	-

[The following parameter, X_{boil}, will only be included if the CPA falls under Case 2.]

Data / Parameter	X_{boil}
Unit	Fraction
Description	The proportion of total population for which the common practice of water purification is or would have been water boiling;
Source of data	Survey or literature (For survey sampling refer to the sampling section of the monitoring plan under B.7.2)
Value(s) applied	Refer to specific CPA
Choice of data or Measurement methods and procedures	Ex-ante surveys or literature will measure this parameter.
Purpose of data	Calculation of Case 2 baseline emissions
Additional comment	Applicable only to Case 2

Data / Parameter	WH
Unit	Kj/L ^{o}C
Description	Specific Heat of Water
Source of data	Default Value from AMS-III.AV Version 4
Value(s) applied	4.186
Choice of data or Measurement methods and procedures	-
Purpose of data	Calculation of baseline emissions
Additional comment	-

Data / Parameter	T_f
Unit	^{o}C
Description	Final Temperature
Source of data	Default Value from AMS-III.AV Version 4
Value(s) applied	100
Choice of data or Measurement methods and procedures	-
Purpose of data	Calculation of baseline emissions
Additional comment	-

Data / Parameter	T_i
Unit	^{o}C
Description	Initial Temperature
Source of data	Default Value from AMS-III.AV Version 4
Value(s) applied	20
Choice of data or Measurement methods and procedures	-
Purpose of data	Calculation of baseline emissions
Additional comment	-

Data / Parameter	WHE
Unit	Kj/L
Description	Latent Heat of Water Evaporation
Source of data	Default Value from AMS-III.AV Version 4
Value(s) applied	2,260
Choice of data or Measurement methods and procedures	-
Purpose of data	Calculation of baseline emissions
Additional comment	-

Data / Parameter	L
Unit	-
Description	Leakage
Source of data	Default Value from AMS-I.E Version 5
Value(s) applied	.95
Choice of data or Measurement methods and procedures	Methodological default
Purpose of data	Calculation of leakage emissions
Additional comment	-

Data / Parameter	$EF_{EL,j,y}$
Unit	tCO2/MWh
Description	Emission factor for electricity generation for source j in year *y* (tCO2/MWh)
Source of data	As per the "Tool to calculate baseline, project, and/or leakage CO_2 emissions from electricity consumption" Version 1
Value(s) applied	1.3
Choice of data or Measurement methods and procedures	Default value from the "Tool to calculate baseline, project, and/or leakage CO_2 emissions from electricity consumption" Version 1: **Scenario A: Electricity system** In this case, project participants may choose among the following options: Option A1: Calculate the combined margin emission factor of the applicable electricity system, using the procedures in the latest approved version of the Tool to calculate the emission factor for an electricity system ($EF_{EL,j/k/l,y} = EF_{grid,CM,y}$). Option A2: Use the following conservative default values: A value of 1.3 tCO2/MWh if (a) Scenario A applies only to project and/or leakage electricity consumption sources but not to baseline electricity consumption sources; or (b) Scenario A applies to both baseline and project (and/or leakage) electricity consumption sources; and the electricity consumption of the project and leakage sources is greater than the electricity consumption of the baseline sources. Option A2 will be used.
Purpose of data	To calculate project emissions
Additional comment	To be considered only in the case the water purification device consumes electricity

Data / Parameter	$TDL_{j,y}$
Unit	Fraction
Description	Average technical transmission and distribution losses for providing electricity to source j in year y
Source of data	As per the "Tool to calculate baseline, project, and/or leakage CO_2 emissions from electricity consumption" Version 1
Value(s) applied	20%
Choice of data or Measurement methods and procedures	Default value from the "Tool to calculate baseline, project, and/or leakage CO_2 emissions from electricity consumption" Version 1
Purpose of data	To calculate project emissions
Additional comment	To be considered only in the case the water purification device consumes electricity

B.6.3. Ex-ante calculations of emission reductions

[In this section, each CPA-DD will demonstrate calculation of ex-ante emission reductions pertaining to the specific CPA and CPA type using the methodological equations demonstrated in section B.6.1 above. A generic tabulated emission reduction format is provided below.]

Year	Baseline emissions (t CO_2e)	Project emissions (t CO_2e)	Leakage (t CO_2e)	Emission reductions (t CO_2e)
Year 1	XXXX	XXXX	XXXX	XXXX
Year 2	XXXX	XXXX	XXXX	XXXX
Year 3	XXXX	XXXX	XXXX	XXXX
Year 4	XXXX	XXXX	XXXX	XXXX
Year 5	XXXX	XXXX	XXXX	XXXX
Year 6	XXXX	XXXX	XXXX	XXXX
Year 7	XXXX	XXXX	XXXX	XXXX
Total	XXXX	XXXX	XXXX	XXXX
Total number of crediting years	7			
Annual average over the crediting period	XXXX	XXXX	XXXX	XXXX

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

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

(Copy this table for each data and parameter)

QPW_y, the total volume of drinking water produced by technologies under the CPA is calculated through Equation (1.a) or (1.b) in the PoA-DD document, therefore parameters $T_{y,i}$ and $R_{y,i}$ need to be monitored, a value of 5.5 litres per person per day shall not be exceeded.

Data / Parameter	QPW_y
Unit	Liters/yr
Description	Quantity of purified water in year *y* (litres)
Source of data	Calculation
Value(s) applied	Refer to specific CPA
Measurement methods and procedures	Calculated through Equation (1.a) or (1.b) For Case 1: $QPW_y = \sum_0^i (T_{y,i} \times R_{y,i} \times 365 \times Water\ Quality_i \times Operational\ Units_i)$ For Case 2: $QPW_y = \sum_0^i (X_{boil} \times T_{y,i} \times R_{y,i} \times 365 \times Water\ Quality_i \times Operational\ Units_i)$
Monitoring frequency	Annual or at least biennial as per the monitoring requirements in the methodology
QA/QC procedures	-
Purpose of data	Calculation of baseline emissions
Additional comments	-

Data / Parameter	$T_{y,i}$
Unit	units
Description	Total distributed water purification systems
Source of data	Sales invoices database
Value(s) applied	Refer to specific CPA
Measurement methods and procedures	The total number of units by technology type and date deployed in each specific CPA is tracked in the in the Project Database, using Sales Receipts. All units distributed will be recorded. Any unit not recorded in the Project Database will not be credited for emission reductions.
Monitoring frequency	Continuous
QA/QC procedures	Sales Database is cross-checked with paper records to ensure transparent and robust data. Replacement units will be captured in monitoring the number of $Operational\ Units_i$
Purpose of data	Calculation of QPW_y Used in equation (1.a) or (1.b), see section D.6.1
Additional comments	-

Data / Parameter	$R_{y,i}$
Unit	Liters/unit/day
Description	Average volume of drinking water per unit per day
Source of data	Direct Monitoring of a representative sample.
Value(s) applied	Refer to Specific CPA
Choice of data or Measurement methods and procedures	Directly monitored using quantitative surveys or measurements of a representative sample. Survey shall ensure that only drinking water is measured, water purified and used for other purposes shall be excluded.
Monitoring frequency	Annual or at least biennial as per the monitoring requirements in the methodology
QA/QC procedures	$N_{y,i}$ multiplied by $R_{y,i}$ shall not exceed the maximum output of the technology [per unit]. Enumerators shall be trained to ensure accurate calculation of purified water and assessment of purified water used for drinking.
Purpose of data	Calculation of QPW_y Used in equation (1.a) or (1.b), see section D.6.1
Additional comments	Per the methodology, if the calculation of QPW_y is based on the average volume of drinking water per person per day, a value of 5.5 litres per person per day shall not be exceeded.

Data / Parameter	$N_{y,i}$
Unit	Persons/unit
Description	The average population serviced by water purification systems
Source of data	Surveys
Value(s) applied	Refer to Specific CPA
Measurement methods and procedures	The number of people using the unit will be monitored.
Monitoring frequency	At least biennial per methodology.
QA/QC procedures	$N_{y,i}$ multiplied by $R_{y,i}$ shall not exceed the maximum output of the technology [per unit].
Purpose of data	Used for capping the treated water consumed at 5.5 litres per person per day per paragraph 6 of the methodology.
Additional comments	-

Data / Parameter	Water Quality
Unit	[proportion]
Description	Water quality measurement
Source of data	Sampling surveys
Value(s) applied	Refer to specific CPA
Measurement methods and procedures	Water Quality testing will be done on sample of units per each technology type. After samples are chosen, a dedicated water container will be taken to the location where the system is installed to take a sample of the cleaned water for testing using the appropriate testing technology. Water quality is defined in a relevant national standard or guidelines for drinking water quality. An indicator may be monitored to assess whether samples meet these requirements. In case a national standard / guideline for drinking water quality is not available, the interim performance targets as per "Evaluating household water treatment options: Health based targets and microbiological performance specifications" (WHO, 2011). Each unit is deemed to meet relevant standards or not. The parameter is a proportion of units of the specific technology type that meet standards out of the total units sampled.
Monitoring frequency	Annual or at least biennial as per the monitoring requirements in the methodology.
QA/QC procedures	As per the World Health Organizations Guidelines[46] it is more cost-effective and feasible to monitor indicator organisms such as E.coli. Monitoring of proxies such as E.coli, faecal coliform counts, chlorine levels may be used to assess Water Quality. Enumerators will be trained on proper testing procedures and the appropriate testing technology will be used.
Purpose of data	Eligibility criteria and calculation of QPW_y Used in equation (1.a) or (1.b), see section D.6.1
Additional comments	-

[46] WHO 'Guidelines for Drinking-water Quality, Fourth Edition
www.who.int/**water**_sanitation_health/publications/.../dwq_**guidelines**/ Page 41

Data / Parameter	Operational Units
Unit	-
Description	Monitoring to check the percentage of the monitoring period which units of each technology type are in use
Source of data	Sampling surveys
Value(s) applied	Refer to specific CPA
Measurement methods and procedures	Surveys will be conducted on sample of units per each technology type. The survey will then determine what percentage of days of the monitoring period the unit is in use by the end user. The mean of the percentage of operational days of the monitoring period of the samples will be applied for the parameter for each technology type.
Monitoring frequency	At least once per verification or biennially as per the monitoring requirements in the methodology.
QA/QC procedures	In the case that the unique serial number is no longer visible enumerators will inquire as to the date of purchase of the unit to ensure that the unit is not a replacement. If the specific unit selected for monitoring has been replaced it will be marked as out of use and deemed to be operational for 0% of the relevant monitoring period. Enumerators will be trained as to proper procedures to assess the percentage of the monitoring period which the unit is used.
Purpose of data	Calculation of QPW_y Used in equation (1.a) or (1.b), see section D.6.1
Additional comments	-

Data / Parameter	$f_{NRB,y}$
Unit	-
Description	Fraction of woody biomass used in the absence of the project activity in year *y* that can be established as non-renewable
Source of data	EB 67 Annex 22 Default Values for Fraction of Non-Renewable Biomass for Least Developed Countries and Small Island Developing States, combined with survey, national, or regional data to determine the percent of users using woody biomass and fossil fuel in the baseline scenario. If the displaced fuel is fossil fuel use the default value of 1.0. If a mixture of woody biomass and fossil fuels is used in the absence of the project activity a weighted average value should be used, using surveys or national data.
Value(s) applied	See Specific CPA
Measurement methods and procedures	The type of baseline fuel(s) used by target population will be determined via survey, national, or regional data. Parameter will be determined using the default values from EB67 Annex 22 for woody biomass and from the methodology for fossil fuels: If a mixture of woody biomass and fossil fuels is used in the absence of the project activity a weighted average value shall be applied, calculated through the following formula: $f_{NRB,y}$ = [Default f_{NRB} value] * [% of users using NRB] + [1.0] * [% of users using fossil fuels]
Monitoring frequency	Continuously or at least biennial as per the monitoring requirements in the methodology.
QA/QC procedures	Enumerators will be trained as to proper procedures to assess the baseline stove that is being or would have been used to boil water.
Purpose of data	Calculation of baseline emissions
Additional comment	Use of national data for the type of baseline fuel used is appropriate if the CPA covers the entire boundary of the host country. In case CPAs cover specific portions of the country, regional government data may be used to ensure more conservative and accurate representation of the target populations.

Data / Parameter	η_{wb}
Unit	Fraction
Description	Efficiency of water boiling system being replaced
Source of data	Default values as per AMS-III.AV combined with survey, national, or regional data to determine the percent of users using different types of water boiling systems in the baseline scenario.
Value(s) applied	See Specific CPA

<table>
<tr><td>Measurement methods and procedures</td><td>The type of baseline water boiling systems used by target population will be determined via survey, national, or regional data.

Parameter will be determined using the following default values from AMS-III.AV:
<table><tr><th>Baseline Water Boiling System</th><th>Default Efficiency Value</th></tr><tr><td>Unimproved biomass burning stove (UBBS)</td><td>0.1</td></tr><tr><td>Other biomass burning stove (OBBS)</td><td>0.2</td></tr><tr><td>Fossil fuel stove (FFS)</td><td>0.5</td></tr></table>
If more than one system is encountered, a weighted average value shall be applied, calculated through formula below:

η_{wb} = [Default efficiency of UBBS] * [% of UBBS users] +
[Default efficiency of OBBS] * [% of OBBS users] +
[Default efficiency of FFS] * [% of FFS users]</td></tr>
<tr><td>Monitoring frequency</td><td>Continuously or at least biennial as per the monitoring requirements in the methodology.</td></tr>
<tr><td>QA/QC procedures</td><td>Enumerators will be trained as to proper procedures to assess the baseline stove that is being or would have been used to boil water.</td></tr>
<tr><td>Purpose of data</td><td>Calculation of baseline emissions</td></tr>
<tr><td>Additional comment</td><td>Use of national data to determine the proportion of people using each type of baseline water boiling system is appropriate if the CPA covers the entire boundary of the host country. In case CPAs cover specific portions of the country, regional government data may be used to ensure more conservative and accurate representation of the target populations.</td></tr>
</table>

Data / Parameter	$EF_{projected\_fossilfuel}$
Unit	tCO2/TJ
Description	Emission factor as per AMS-I.E procedures when NRB is displaced or the emission factor of the fossil fuel substituted
Source of data	AMS-I.E as referenced by AMS-III.AV Version 4 for f_{NRB} and IPCC default values for fossil fuels, combined with survey, national, or regional data to determine the percent of users using woody biomass and fossil fuel(s) in the baseline scenario.
Value(s) applied	See Specific CPA
Measurement methods and procedures	The type of baseline fuel used by target population will be determined via survey, national, or regional data. Parameter will be determined using the following default values from AMS-I.E as referenced by AMS-III.AV Version 4 and IPCC (2006): **Emission Factor for Baseline Fuels** / **Emissions Factor** / **Source** EF_{NRB} / 81.6 tCO2/TJ / AMS-I.E $EF_{NaturalGas}$ / 56.1 tCO2/TJ / IPCC In the PoA boundary of Rwanda and Uganda, the population uses either woody biomass or fossil fuel.[47,48] To apply a conservative estimate of CERs, all fossil fuel used is assumed to be Natural Gas as this fuel has the lowest emission factor. If a mixture of woody biomass and fossil fuels is used in the absence of the project activity a weighted average value shall be applied, calculated through the following formula: $EF_{projected\_fossilfuel}$ = [EF_{NRB}]*[% of users using NRB] + [$EF_{Natural\ Gas}$]*[% of users using Natural Gas] + [$EF_{Kerosene}$]*[% of users using Kerosene]
Monitoring frequency	Continuously or at least biennial as per the monitoring requirements in the methodology.
QA/QC procedures	Enumerators will be trained as to proper procedures to assess baseline fuel usage.
Purpose of data	Calculation of baseline emissions
Additional comment	Use of national data for the type of baseline fuel used is appropriate if the CPA covers the entire boundary of the host country. In case CPAs cover specific portions of the country, regional government data may be used to ensure more conservative and accurate representation of the target populations.

[47] Rwanda: Biomass Energy Strategy (BEST) Rwanda, RBESS, MININFRA, 2009
[48] Uganda: National Uganda National Household Survey 2009/2010

Data / Parameter	Existence of public distribution network of safe drinking water
Unit	-
Description	Existence of public distribution network of safe drinking water in year y
Source of data	Surveys and or updated credible national/local reports/letters/announcements in relation to the existence of water networks in the region
Value(s) applied	-
Measurement methods and procedures	Review of surveys or credible national/local reports/letters/announcements
Monitoring frequency	Annual or at least biennial as per the monitoring requirements in the methodology
QA/QC procedures	-
Purpose of data	Eligibility criteria
Additional comments	-

Data / Parameter	$EC_{PJ,j,y}$
Unit	MWh/yr
Description	Quantity of electricity consumed by the project electricity consumption source *j* in year *y*
Source of data	Manufacturers' specifications, surveys, or direct monitoring
Value(s) applied	Refer to Specific CPA
Choice of data or Measurement methods and procedures	As per the "Tool to calculate baseline, project, and/or leakage CO_2 emissions from electricity consumption" Version 1. Electricity Consumption may be directly monitored or Manufacturers' specifications may be used to calculate electricity consumed by assuming that the unit is operating 24 hours a day all year or applying manufacturers' specification to user reported operation hours
Monitoring frequency	Annual or at least biennial as per the monitoring requirements in the methodology.
QA/QC procedures	If surveys are conducted annually they will meet 90/10 confidence and precision, if they are conducted biennially they will meet 95/10 confidence and precision
Purpose of data	Calculation of project emissions
Additional comment	To be considered only in the case the water purification device consumes electricity

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

The monitoring procedures and sampling plan for the PoA is in-line with *AMS-III.AV low greenhouse gas emitting safe drinking water production systems* (Version 4) and the procedures outlined in paragraph 18 of the *Standard for Sampling and Surveys for CDM Project Activities and Programme of Activities* (EB 74, Annex 6), which refers to the *Guidelines for Sampling and Surveys for CDM Project Activities and Programme of Activities* (EB 75, Annex 8):

a) Sampling design

(i) Objectives and Reliability Requirements
(ii) Target population
(iii) Sampling method
(iv) Sample size
(v) Sampling frame

b) Data to be collected
(i) Field measurements
(ii) Quality Assurance/Quality control
(iii) Analysis

c) Implementation plan
d) Data Storage
e) Monitoring management

The above criteria are elaborated in the forthcoming paragraphs.

a) Sampling Design

Flexibility to apply cross-CPA sampling is critical for the feasibility of the proposed PoA due to the large number of CPAs envisaged. Cross-CPA sampling may only be conducted for CPAs of the same type to ensure homogeneity. The CME will define a sampling frame for each CPA type such that the homogeneity of the group can be expected to be sufficient to allow for cross-CPA sampling. The criteria for homogeneity across CPAs per EB 75 Annex 8 are listed in section *(v) Sampling Frame* below. A sampling approach may be set in a CPA, but as additional CPAs are included the sampling approach may change to enable cross-CPA sampling.

As a rule, the most appropriate confidence/precision levels required by the methodology AMS-III.AV (Version 4) and the Sampling Standard will be applied whenever sampling is undertaken. According to the Sampling Standard, 95/10 reliability is to be applied whenever sampling across a group of CPAs, which will typically be the case for this PoA. In the case of conducting CPA-specific sampling, the methodology AMS-III.AV (Version 4) requires 90/10 confidence/precision if annual sampling is applied, or 95/10 confidence/prevision if biennial (every two years) sampling is applied.

(i) Objectives and Reliability Requirements

The objective of the sampling effort will be to meet the monitoring requirements set forth in the methodologies AMS-III.AV (Version 4), as detailed in B.7.1 above. Monitoring will be carried out on an annual basis (or biennial for specific parameters when allowed by the methodology, see B.7.1.). As the PoA progresses and the number of CPAs increases, the sampling plan can apply to a group of CPAs as referred to in EB 75, Annex 8. This will be applicable to CPA types as long as homogeneity can be demonstrated. When homogeneity cannot be demonstrated the CME may monitor CPAs individually. All monitoring shall be coordinated by the CME, Impact Carbon.

The parameters to be obtained by means of sampling are listed below:

Parameter	Estimated Parameter Value*
$N_{y,i}$	[#]
$R_{y,i}$	[#]
$Water\ Quality_i$	[0-100]%
$Operational\ Units_i$	[0-100]%
$EC_{PJ,j,y}$	[#] MWh/yr
$f_{NRB,y}$	[% of population using NRB, combined with default values]
η_{wb}	[% of each type of baseline stove usage, combined with default values]
$EF_{projected\_fossilfuel}$	[% of each type of baseline fuel, combined with default values]

*See specific-CPA.

Note that parameters $f_{NRB,y}$, η_{wb}, and $EF_{projected\_fossilfuel}$ shall be determined through default values combined with survey, national, or regional data. In case survey is chosen, the sampling plan described below shall apply.

(ii) Target Population

The target population for the application of monitoring procedure will be the community centers, including restaurants, villages, offices, or health centers, in which water purification systems have been installed, as identified through the centralised record-keeping Project Database managed by the CME. The database will include a unique identification number of the unit and end-user information including the location of the household. CPAs will be grouped by CPA type, and only CPAs of the same type and located in the same country may be sampled together.

(iii) Sampling method

See Section B.7.2 from Generic CPA 1, section *(iii) Sampling Method*.

(iv) Sample size

The sampling method, either simple random, stratified random sampling, or multi-stage sampling will be determined separately for each CPA, as described and justified below. The sample will be representative so that if multiple CPAs are grouped in the monitoring process the proportion of units sampled from each CPA will equal the proportion of total units in operation in the various CPAs, and 95/10 will be achieved for cross-CPA monitoring. If monitoring occurs on an annual basis for an individual CPA then any representative sampling will satisfy the 90/10 confidence/precision requirement. If monitoring occurs every two years for an individual CPA then any representative sampling will satisfy the 95/10 confidence/precision requirement. If the required level of accuracy (confidence/precision) is not achieved, the sample size can be expanded.

1. Simple random sampling may be used for monitoring all of the sampled parameters when the following conditions exist (as outlined in the table below). Justification for the use of this approach for each parameter is provided in table below:

Parameter	Justification/Assumptions for Simple Random Sampling
$N_{y,i}$	One technology and target group type; Devices not widely dispersed geographically
$R_{y,i}$	One technology and target group type; Devices not widely dispersed geographically
Water Quality$_i$	One technology and target group type; Devices not widely dispersed geographically
Operational Units$_i$	One technology and target group type; Devices not widely dispersed geographically
$EC_{PJ,j,y}$	One technology and target group type; Devices not widely dispersed geographically
$f_{NRB,y}$	Devices not widely dispersed geographically (technology and target goup type not applicable as parameter refers to baseline scenario)
η_{wb}	Same as η_{wb}
$EF_{projected\_fossilfuel}$	Same as η_{wb}

Sample size is determined for Proportional Values under simple random sampling using:

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

Where:

n = Sample Size
N = Total Number of Households
p = Expected proportion
1.645 = Represents the 90% confidence interval (1.96 represents the 95% confidence interval)
0.1 = Represents the 10% relative precision

Sample size is determined for a Mean Value under simple random sampling using:

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

Where:

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

Where:

n = Sample Size
N = Total Number of Households
mean = Mean
SD = Standard deviation
1.645 = Represents the 90% confidence interval (1.96 represents the 95% confidence interval)
0.1 = Represents the 10% relative precision

2. Stratified random sampling may be used when the following conditions exist (as outlined in the table below). Stratified sampling is used to account for differences in technologies and/or target

groups within one CPA. In the case that one CPA has a single technology type, but multiple distinct target group, i.e. restaurants and villages, the strata would be the target group. Therefore the strata shall be the technology type and/or the target group.

Parameter	Justification/Assumptions for Stratified Random Sampling
$N_{y,i}$	Multiple technology types and/or target groups
$R_{y,i}$	Multiple technology types and/or target groups
Water Quality$_i$	Multiple technology types and/or target groups
Operational Units$_i$	Multiple technology types and/or target groups
$EC_{PJ,j,y}$	Multiple technology types and/or target groups
$f_{NRB,y}$	Multiple target groups only, stratification by technology type only is not applicable as parameter refers to baseline scenario
η_{wb}	Same as η_{wb}
$EF_{projected\_fossilfuel}$	Same as η_{wb}

Sample size is determined for Proportional Values under stratified random sampling using:

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

Where: $V = \frac{SD^2}{\overline{p}^2} = \frac{\text{overall variance}}{\overline{p}^2}$ and $\overline{p}$ is the overall proportion.

Where:

n = Total sample size
1.645 = Represents the 90% confidence interval (1.96 represents the 95% confidence interval)
0.1 = Represents the 10% relative precision

Where:

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

Where:

n_i = Sample size of the i^{th} group, where i=1,..,k
g_i = Size of the i^{th} group, where i=1,..,k
N = Population total

Where:

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

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

Where:

p_i = Proportion for the i^{th} group, where i=1,…,k

Using above equations, the total sample size (n) is calculated. The total sample size must be divided into the sample size for each group, i.e. each technology type. This division of the total sample size is calculated through the following equation:

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

Sample size is determined for a Mean Value under stratified random sampling using:

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

Where:

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

Where:

n	Sample Size
N	= Total Number of Households
mean	= Mean
SD	= Overall Standard deviation
1.645	= Represents the 90% confidence interval (1.96 represents the 95% confidence interval)
0.1	= Represents the 10% relative precision

Where:

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

Where:

SD	= Weighted overall standard deviation (SD_i Standard Deviation of the i^{th} group where i=1…,k
g_a	= Size of the i^{th} group where i=1,…,k
N	= Population total

Where:

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

Where:

mean = Weighted overall mean
m_i = Mean of the i^{th} group where i=1,…,k

Using above equations, the total sample size (n) is calculated. The total sample size must be divided into the sample size for each group, i.e. each technology type. This division of the total sample size is calculated through the following equation:

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

In order to establish the sample size (the number of groups to be sampled) using the above formulas, the following parameters must be known:
– the total number of strata in the population
– the average units per strata
– an estimate of the proportion/mean
– an estimate of the variance within each strata

3. Multi-stage sampling may also be used when the following conditions exist (as outlined in the table below). Multi-stage sampling consists of selecting primary clusters units and sampling from the secondary sampling units. The primary sampling units shall be administrative clusters, i.e. district, region, county, or village [to be determined at specific CPA]. The secondary sampling unit shall be the units.

Parameter	Justification/Assumptions for Multi-stage Sampling
Ny	Devices widely dispersed geographically
Ry	Devices widely dispersed geographically
Water Quality$_i$	Devices widely dispersed geographically
Operational Units$_i$	Devices widely dispersed geographically
$EC_{PJ,j,y}$	Devices widely dispersed geographically
$f_{NRB,y}$	Devices widely dispersed geographically – use same location for baseline
η_{wb}	Same as η_{wb}
$EF_{projected\_fossilfuel}$	Same as η_{wb}

Sample size is determined for proportional values under multi-stage sampling using:

$$c \geq \frac{\frac{SD_B^2}{\overline{p}^2} \times \frac{M}{M-1} + \frac{1}{\overline{u}} \times \frac{SD_w^2}{\overline{p}^2} \times \frac{(\overline{N}-\overline{u})}{(\overline{N}-1)}}{\frac{0.1^2}{1.645^2} + \frac{1}{M-1} \times \frac{SD_B^2}{\overline{p}^2}}$$

Where:

c Number of groups that should be sampled
M Total number of groups in the population

$\overline{u}$	Number of units to be sampled within each group
$\overline{N}$	Average units per group
SD_B^2	Unit variance
SD_W^2	Average of the group variances
p	Overall proportion
1.645	Represents the 90% confidence interval (1.96 represents the 95% confidence interval)
0.1	Represents the 10% relative precision

Sample size is determined for mean values under multi-stage sampling using:

$$c \geq \frac{\left(\frac{SD_B}{Clustermean}\right)^2 \times \left(\frac{M}{M-1}\right) + \left(\frac{1}{u}\right) \times \left(\frac{SD_W}{Overallmean}\right)^2 \left(\frac{\overline{N}-u}{\overline{N}-1}\right)}{\left(\frac{0.1}{1.645}\right)^2 + \frac{1}{M-1}\left(\frac{SD_B}{Clustermean}\right)^2}$$

Where:

c	= Number of groups that should be sampled
M	= Total number of groups in the population
$\underline{u}$	= Number of units to be sampled within each group
$\overline{N}$	= Average units per group
SD_B	= Standard deviation between groups
SD_W	= Average within group standard deviation
Clustermean	= The cluster or group mean
Overall mean	= The average across all households
1.645	= Represents the 90% confidence required (1.96 for 95% confidence)
0.1	= Represents the 10% relative precision

The precision and expected variance is established in accordance with the recommended values by UNFCCC[49], namely 95% precision and 10% expected variance, for cross-CPA sampling.

In order to establish the sample size (the number of groups to be sampled) using the above formulas, the following parameters must be known:
- the total number of groups in the population
- the average units per group
- an estimate of the proportion/mean
- an estimate of the variance between and within groups

The sample size calculation will be automated in an Excel spreadsheet so that different scenarios may be estimated.

If the sample size calculation returns a value of less than 30 samples, a minimum of 30 samples will be conducted.

(v) Sampling frame

See Section B.7.2 from Generic CPA 1, section *(v) Sampling frame*.

[49] Standard for Sampling and Surveys for CDM Project Activities and Programme of Activities (EB 74, Annex 6).

b) Data to be collected

(i) Field measurements

Field measurement objectives and data to be collected are listed in section B.7.1. The parameters to be sampled within each CPA will depend on if the project activity is deemed to be Case 1 or Case 2, as outlined below.

For each CPA, the following parameters are determined through sampling:

a) $N_{y,i}$
b) $R_{y,i}$
c) *Water Quali*ty
d) *Operational Units* $_i$
e) $EC_{PJ,j,y}$
f) η_{wb}
g) $f_{NRB,y}$
h) $EF_{projected\_fossilfuel}$

Parameters will be obtained using sampling and will meet 90/10 confidence precision when sampled as a single CPA and 95/10 confidence and precision when sampled across CPAs or if monitoring is conducted on a biennial (every two years) basis.

For CPAs that fall under Case 2 (e.g. more than 60% of the target population have access to clean drinking water), ex-ante surveys are undertaken to establish:

i) X_{boil} - the proportion of total population for which the common practice of water purification is or would have been water boiling

The CPA monitoring draws on information from the electronic data management system. The CME will operate and manage an electronic data management system that will store information on and track all technologies under the PoA. The system will contain the following information:

- Volume of units disseminated under the PoA
- Technology type for each unit
- Unique Identification Number for each unit
- Name, address, and contact information of the end-user (where possible)
- Date of installation (where possible)
- CPA assignment

The date of installation for each unit is used to determine the portion of the monitoring period during which the unit was active. Products deployed under the project activity are assumed be in operation as of the start of the next month following the date of sale, i.e. if the date of sale is April 1st, the start of operation is May 1st.

Monitoring will ensure the water quality of the water treated by the products employed under each CPA, as required under AMS-III.AV (Version 4). It shall be demonstrated that the application of the project technology/equipment achieves compliance with "protective"[50] or interim WHO performance targets as per "Evaluating households water treatment options: Health based targets and microbiological performance specifications" (WHO, 2011) or a comparable national standard or guideline. As per the

[50] Protective default performance target is defined by a 2 $\log_{10}$ reduction of bacteria, a 3 $\log_{10}$ reduction of viruses and a 2 $\log_{10}$ reduction of protozoa ("protective"). The reference pathogens shall be C. Jejuni, C*R*yptosporidium, and rotavirus.

World Health Organizations Guidelines[51] it is more cost-effective and feasible to monitor indicator organisms such as E.coli. Monitoring of proxies such as E.coli, faecal coliform counts, chlorine levels may be used to assess water quality. Enumerators will be trained on proper testing procedures and the appropriate testing technology will be used.

Upon installation of the water purification units, and associated accessories, the user will sign a Sales Receipt. For units that are not self-installed, a Sales Receipt will be signed upon commissioning. The sales and installation persons shall be responsible for ensuring that all data are complete and accurate within respective documents. Hard copies of both documents will be kept at the office of the CME, and all data entered into a central record keeping database.

The record keeping database will be used to record the results of all monitoring, thereby avoiding double counting, with all data stored to be kept for at least two years after the crediting period or the last issuance of CERs for the project activity. The data will be stored electronically in the database, with original hard copies of all collected monitoring data also kept.

(i) Quality Assurance/Quality Control

See Section B.7.2 from Generic CPA 1, section *(ii) Quality Assurance/Quality Control*.

(ii) Analysis

See Section B.7.2 from Generic CPA 1, section *(iii) Analysis*.

(c) Implementation Plan

See Section B.7.2 from Generic CPA 1, section *(c) Implementation Plan.*

(d) Data storage

See Section B.7.2 from Generic CPA 1, section *(d) Data storage.*

(e) Monitoring Management

See Section B.7.2 from Generic CPA 1, section *(e) Monitoring Management*.

[51] WHO 'Guidelines for Drinking-water Quali*T*$_y$, Fourth Edition
www.who.int/**water**_sanitation_health/publications/.../dwq_**guidelines**/ Page 41

Appendix 1: Contact information on entity/individual responsible for the PoA

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Country	United States
Telephone	+1 415 968 9087
Fax	-
E-mail	jtran@impactcarbon.org
Website	www.impactcarbon.org
Contact person	Jimmy Tran
Title	Project Development Director
Salutation	-
Last name	Jimmy
Middle name	-
First name	Tran
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Direct fax	+1 415 651 9684
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Personal e-mail	jtran@impactcarbon.org

Appendix 2: Affirmation regarding public funding

The CME, Impact Carbon, states that no public funding was received for the implementation of the Impact Carbon Safe Water Access Program or any activities within the bounds of the program.

Appendix 3: Application of methodology(ies)

The application of methodology is described in section B.3 of Part I of this document

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

Background information and full ex ante emission reductions calculator is provided separately with project documentation.

Appendix 5: Further background information on the monitoring plan

Detailed background information on the monitoring plan is provided in the CME Manual and Operations Manual submitted with the project documentation.

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History of the document

Version	Date	Nature of revision(s)
02.0	EB 66 13 March 2012	Revision required to ensure consistency with the "Guidelines for completing the programme design document form for small-scale CDM programmes of activities" (EB 66, Annex 13).
01	EB33, Annex43 27 July 2007	Initial adoption.
Decision Class: Regulatory **Document Type:** Form **Business Function:** Registration		